GPQM96

Power Quality Meter

Modbus Register Manual

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1. Overview

This user manual is the operation instruction for GPQM96 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 discretes
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 event record (function code 0x14)

Request

Function code	1 byte	0x14
Number of bytes	1 byte	0x07
Sub request x, parameter type	1 byte	0x06
Sub request x, file number	2 bytes	0x0000-0x0007
Sub request x, record number	2 bytes	0x0000-0x7D00
Sub request x, record length	2 bytes	N

Response

Function code	1 byte	0x14
Response data length	1 byte	0x07～0xF5
Sub request x, file's corresponding length	1 byte	0x07～0xF5
Sub request x, reference type	1 byte	6
Sub request x, record data	N×2 byte	...

Sub request file number, record number and record length description of the sent message

Data record	File number	Record number	Record length
SOE event	0x0000	0x0000～0x00BF 0x0000: the latest piece of SOE event 0x0001: the 1st piece of SOE event previous to the latest one ... 0x001F: the 191st piece of SOE event previous to the latest one	12
Voltage swell	0x0001	0x0000～0x000F:	9

event		0x0000: the latest piece of voltage swell event 0x0001: the 1st piece of voltage swell event previous to the latest one ... 0x000F: the 15th piece of voltage swell event previous to the latest one	
Voltage dip event	0x0002	0x0000～0x000F: 0x0000: the latest piece of voltage dip event 0x0001: the 1st piece of voltage dip event previous to the latest one ... 0x000F: the 15th piece of voltage dip event previous to the latest one	9
Voltage interruption	0x0003	0x0000～0x000F: 0x0000: the latest piece of voltage interruption event 0x0001: the 1st piece of voltage interruption event previous to the latest one ... 0x000F: the 15th piece of voltage interruption event previous to the latest one	9
Data record	0x0004	0x0000～0x7CFF: 0x0000: the latest piece of data record 0x0001: the 1st piece of data record previous to the latest one ... 0x7CFF:the 31999th piece of data record previous to the latest one	1～38
Fault wave	0x0006	High byte：0x0000～0x0009, indicates which	When the low

record		piece of fault wave record; 0x0000: the latest piece of fault wave record 0x0001: the 1st piece of fault wave record previous to the latest one ... 0x0009: the 9th piece of fault wave record previous to the latest one	byte is 0, the record length is 1~18; When the low byte is 1～0x3C, the record length is 1～80.
		Low byte：0～0x3C The content of the fault wave record requested 0：fault wave record information, start and end time and extreme value 1：the 1st cycle waveform data of V1 2：the 1st cycle waveform data of V2 3：the 1st cycle waveform data of V3 4：the 1st cycle waveform data of I1 5：the 1st cycle waveform data of I2 6：the 1st cycle waveform data of I3 7-12：the 2nd cycle waveform data of V1,V2,V3,I1,I2,I3 13-18：the 3rd cycle waveform data of V1,V2,V3,I1,I2,I3 19-24：the 4th cycle waveform data of V1,V2,V3,I1,I2,I3 25-30：the 5th cycle waveform data of V1,V2,V3,I1,I2,I3 31-36：the 6th cycle waveform data of V1,V2,V3,I1,I2,I3 37-42：the 7th cycle waveform data of	

		V1,V2,V3,I1,I2,I3 43-48：the 8th cycle waveform data of V1,V2,V3,I1,I2,I3 49-54：the 9th cycle waveform data of V1,V2,V3,I1,I2,I3 55-60：the 10th cycle waveform data of V1,V2,V3,I1,I2,I3	
Manual wave record	0x0007	High byte：0x00 Low byte：0～0x3C The content of the manual wave record requested 0：manual wave record information, start and end time and extreme value 1：the 1st cycle waveform data of V1 2：the 1st cycle waveform data of V2 3：the 1st cycle waveform data of V3 4：the 1st cycle waveform data of I1 5：the 1st cycle waveform data of I2 6：the 1st cycle waveform data of I3 7-12：the 2nd cycle waveform data of V1,V2,V3,I1,I2,I3 13-18：the 3rd cycle waveform data of V1,V2,V3,I1,I2,I3 19-24：the 4th cycle waveform data of V1,V2,V3,I1,I2,I3 25-30：the 5th cycle waveform data of V1,V2,V3,I1,I2,I3 31-36：the 6th cycle waveform data of V1,V2,V3,I1,I2,I3	When the low byte is 0, the record length is 1~18; When the low byte is 1～0x3C, the record length is 1～80.

		37-42：the 7th cycle waveform data of V1,V2,V3,I1,I2,I3 43-48：the 8th cycle waveform data of V1,V2,V3,I1,I2,I3 49-54：the 9th cycle waveform data of V1,V2,V3,I1,I2,I3 55-60：the 10th cycle waveform data of V1,V2,V3,I1,I2,I3	
Over-voltage	0x0008	0x0000-0x00BF: 0x0000: the latest piece of over-voltage event record 0x0001: the 1st piece of over-voltage event record previous to the latest one ... 0x00BF: the 191st piece of over-voltage event record previous to the latest one	9
Under-voltage	0x0009	0x0000-0x00BF: 0x0000: the latest piece of under-voltage event record 0x0001: the 1st piece of under-voltage event record previous to the latest one ... 0x00BF: the 191st piece of under-voltage event record previous to the latest one	9
Over-current	0x000A	0x0000-0x00BF: 0x0000: the latest piece of over-current event record 0x0001: the 1st piece of over-current event record previous to the latest one	9

		... 0x00BF: the 191st piece of over-current event record previous to the latest one	
Under-current	0x000B	0x0000-0x00BF: 0x0000: the latest piece of under-current event record 0x0001: the 1st piece of under-current event record previous to the latest one ... 0x00BF: the 191st piece of under-current event record previous to the latest one	9
Power overload	0x000C	0x0000-0x00BF: 0x0000: the latest piece of power overload event record 0x0001: the 1st piece of power overload event record previous to the latest one ... 0x00BF: the 191st piece of power overload event record previous to the latest one	9
Power underload	0x000D	0x0000-0x00BF: 0x0000: the latest piece of power underload event record 0x0001: the 1st piece of power underload event record previous to the latest one ... 0x00BF: the 191st piece of power underload event record previous to the latest one	9
Rapid voltage change (RVC)	0x000E	0x0000～0x000F: 0x0000: the latest piece of RVC event record	11

		0x0001: the 1st piece of RVC event record previous to the latest one ... 0x000F: the 15th piece of RVC event record previous to the latest one	

Read SOE event record：

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte count	Parameter type	File number	Record number	Data 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	0x0000	0～191	12	CRC16
Message example	01	0x14	0x07	0x06	0x0000	0x0000	0x000C	0xF921
Response								
Frame structure	Address code	Function code	Data code					Check code
			Response data length	File response length	Parameter type	Record data		
Byte	1 byte	1 byte	1 byte	1 byte	1 byte	24 bytes		2 bytes
Message example	0x01	0x14	0x1A	0x19	0x06	SOE recod data		CRC16

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

SOE data format：

Year month day hour minute second millisecond (8 bytes) + DI state change status (4 bytes) + DI current status (4 bytes) + DO state change status (4 bytes) + DO current status (4 bytes)

Year, month, day, hour, minute, second, millisecond: the time when the SOE event occurred

DI state change condition: the status bit corresponding to the change of each digital input from the lowest bit of the byte. 1 indicates that the state of the loop has changed, and 0 indicates that the state is unchanged.

DI current state: the state value corresponding to each digital input from the lowest

bit of the byte. 1 indicates action state, and 0 indicates reset state.

DO state change condition: the status bit corresponding to the change of each relay output from the lowest bit of the byte. 1 indicates that the state of the loop has changed, and 0 indicates that the state is unchanged.

DO current state: the state value corresponding to each relay output from the lowest bit of the byte. 1 indicates action state, and 0 indicates reset state.

Example：

Host request：01 14 07 06 00 00 00 00 00 0C F9 21

Slave response：01 14 1A 19 06

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

① ② ③

F8 48

CRC

①：0E 03 05 08 14 01 01 00

Year month day hour minute second millisecond

Indicates the change of switch state is on March 5, 2014, at 08:20:01:256

②：00 00 00 02 00 00 00 03

“00 00 00 02” indicates the digital input state change condition. Convert 0x00000002 to binary: 0000 0000 0000 0000 0000 0000 0000 0010, bit0 corresponds to the first digital input, and bit1 corresponds to the second digital input. The 2nd digital input state changes, and the states of other circuits are unchanged.

“00 00 00 03” indicates the current digital input state. Convert 0x00000003 to binary：0000 0000 0000 0000 0000 0000 0000 0011，bit0 corresponds to the first digital input, and bit1corresponds to the second digital input. The current 1st and 2nd digital input state is 1 and is in action condition. In combination with the state change (00 00 00 02), it indicates that the current 1st state has not changed, the state remains 1; the 2nd digital input state becomes 1, that is, the state changes from 0 to 1; other digital inputs are in reset hold state.

③：00 00 00 02 00 00 00 00

"00 00 00 02" indicates relay output state change condition. Convert 0x00000002 to binary: 0000 0000 0000 0000 0000 0000 0000 0010, bit0 corresponds to the first relay output, and bit1 corresponds to the second relay output. The 2nd relay output state changes, and the states of other circuits are unchanged.

"00 00 00 00" indicates the current relay output state. Convert 0x00000000 to binary：0000 0000 0000 0000 0000 0000 0000 0000，bit0 corresponds to the first relay output, and bit1 corresponds to the second relay output. The current relay states are in reset condition. In combination with the state change (00 00 00 02), it indicates that the current 1st state has not changed, the state remains 0; the 2nd relay output state becomes 0, that is, the state changes from 1 to 0; other relay outputs are in reset hold state.

Read voltage swell, voltage dip and voltage interruption:

Read event record of voltage swell：

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File number	Record number	Record 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	0x0001	0～15	1～9	CRC16
Message example	0x01	0x14	0x07	0x06	0x0001	0x0000	0x0009	0x04E2
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 bytes		2 bytes
Message example	0x01	0x14	0x14	0x13	0x06	Swell record data		CRC16

Read event record of voltage dip：

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File number	Record number	Record 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	0x0002	0～15	1～9	CRC16
Message example	0x01	0x14	0x07	0x06	0x0002	0x0000	0x0009	0x40E2

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 bytes	2 bytes
Message example	0x01	0x14	0x14	0x13	0x06	Dip record data	CRC16

Read event record of voltage interruption：

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File number	Record number	Record 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	0x0003	0～15	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 bytes		2 bytes
Message example	0x01	0x14	0x14	0x13	0x06	Interruption record data		CRC16

The meter has 16 pieces of voltage swell record, 16 pieces of voltage dip record and 16 pieces of voltage interruption record. Voltage swell, dip, and interruption processing are performed every 10ms. Record the start time, end time, and voltage extreme values of the event. The thresholds and hysteresis of voltage swells, dips,

and interruptions are set by communication.

Data record format of voltage swell, dip and interruption:

Year month day hour minute second millisecond(start time)(8bytes)+Year month day hour minute second millisecond(end time)(8bytes)+voltage extreme(2bytes)

Host request：01 14 07 06 00 01 00 00 00 09 04 E2

Slave response：01 14 14 13 06

0E 03 05 08 14 01 00 78 0E 03 05 08 14 01 02 00 11 D0 4B 84

① ② ③ CRC

①over-voltage start time 0E 03 05 08 14 01 00 78

Year month day hour minute second millisecond

Start time：Mar. 5, 2014, 08:20:01:120

②over-voltage end time 0E 03 05 08 14 01 02 00

Year month day hour minute second millisecond

End time：Mar. 5, 2014, 08:20:01:512

③voltage extreme value during over-voltage(3P4W is phase voltage;3P3W is line voltage)。

11 D0: voltage extreme 456.0 V；For the swell event record, this value is the maximum value of the voltage during the swell; for the dip record and the voltage interruption record, the value is the minimum value of the voltage during the dip.

Read data record

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File number	Record number	Record 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	0～31999	1～38	CRC16

Message example	0x01	0x14	0x07	0x06	0x0004	0x0000	0x0026	0x893E
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	76 bytes		2 bytes
Message example	0x01	0x14	0x4E	0x4D	0x06	Record data		CRC16

Data record format of electrical data

The meter supports up to 32000 pieces of data records. Each data record includes 30 electrical data, 24 fixed electrical data and 6 custom data. The interval of data record can be set by meter's button or communication with reference to communication map. The historical data record frame contains up to 38 words, with the first 3 words time data and the other 35 words electrical data that are secondary value. The description of data record frame is as follow:

Parameters	**Format**	**Unit**
Record time	Int	High byte: year， low byte: month
Record time	Int	High byte: day， low byte: hour
Record 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
THD-V1	Int	0.01%
THD-V2	Int	0.01%
THD-V3	Int	0.01%
THD-I1	Int	0.01%
THD-I2	Int	0.01%
THD-I3	Int	0.01%
EP+	Long	1Wh
EP-	Long	1Wh
EQ+	Long	1varh
EQ-	Long	1varh
ES	Long	1VAh
Custom data 1	Int	
Custom data 2	Int	
Custom data 3	Int	
Custom data 4	Int	
Custom data 5	Int	
Custom data 6	Int	

Take the latest piece of record for example (do not read custom data), the 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

THD-V1 THD-V2 THD-V3 THD-I1 THD-I2 THD-I3

00 00 0F 20 00 00 00 00 00 00 1A 28 00 00 00 00 00 00 1E 37

EP+ EP- EQ+ EQ- ES

74 89

CRC

Read fault wave record:

Read fault wave record(start time data):

Request									
Frame structure	Address code	Function code	Data code						Check code
			Byte counting	Parameter type	File number	Record number		Record length	
Byte	1 byte	1 byte	1 byte	1 byte	2 bytes	1 byte	1 byte	2 bytes	2 bytes
Data range	1～247	0x14	0x07	0x06	0x0006	0～9	0	1～18	CRC16
Message example	0x01	0x14	0x07	0x06	0x0006	0x00	0x00	0x0012	0xF129
Response									
Frame structure	Address code	Function code	Data code						Check code
			Response data length	File response length		Check code		Data record	
Byte	1 byte	1 byte	1 byte	1 byte		1 byte		36 bytes	2 bytes
Message example	0x01	0x14	0x26	0x25		0x06		Fault wave recorder information	CRC16

Read fault wave record(waveform data)：

Request									
Frame structure	Address code	Function code	Data code						Check code
			Byte counting	Parameter type	File number	Record number		Record length	
Byte	1 byte	1 byte	1 byte	1 byte	2 bytes	1 byte	1 byte	2 bytes	2 bytes
Data range	1～247	0x14	0x07	0x06	0x0006	0～9	1～60	1～80	CRC16
Message example	0x01	0x14	0x07	0x06	0x0006	0x00	0x01	0x0050	0x20D8
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				2 bytes
Message example	0x01	0x14	0XA2	0XA1	0x06	Fault wave record data			CRC16

The starting conditions for fault wave record are over-voltage, under-voltage, and over-current events. The over-voltage value and the hysteresis amount, under-voltage value and the hysteresis amount, over-current value and the hysteresis amount are set by communication. After the start condition setting is completed, set the fault wave record enable register (refer to the communication address map).

The meter can store 10 pieces of fault wave record information. Each piece of information records the start time, end time, the voltage maximum and minimum and the current maximum of the fault. Besides, the meter can also record the voltage and current waveform data of the five cycle waves before and after the fault, with the sampling rate 80 points/cycle.

Data format of fault wave record:

Year month day hour minute second millisecond(start time)(8byte)+Year month day hour minute second millisecond(end time)(8byte)+three phase voltage

maximum(6byte)+three phase voltage minimum(6byte)+three phase current maximum(6byte)+fault type(2byte)+the 1st cycle wave of V1(80 points data)(160byte)+the 1st cycle wave of V2(80 points data)(160byte)+the 1st cycle wave of V3(80 points data)(160byte)+the 1st cycle wave of I1(80 points data)(160byte)+the 1st cycle wave of I2(80 points data)(160byte)+the 1st cycle wave of I3(80 points data)(160byte)+the 2nd cycle wave of V1(80 points data)(160byte)+.....+the 10th cycle wave of I2(80 points data)(160byte)+the 10th cycle wave of I3(80 points data)(160byte)。

Start data：Year month day hour minute second millisecond(start time)(8byte)+Year month day hour minute second millisecond(end time)(8byte)+three phase voltage maximum(6byte)+three phase voltage minimum(6byte)+three phase current maximum(6byte)+fault type(2byte)

Fault type：

Fault type	Function	Remark
Bit15-3	Reserve	
Bit2	1：over-current fault 0：no over-current fault	
Bit1	1：under-voltage fault 0：no under-voltage fault	
Bit0	1：over-voltage fault 0：no over-voltage fault	

Waveform data: three-phase current has 10 cycle waves, and 80 data per cycle.

Example：read fault wave recorder information, the start time, end time and extreme values.

Host request：01 14 07 06 00 06 00 00 00 12 F1 29

Slave response：01 14 26 25 06

0E 03 05 08 14 01 00 78 ① 0E 03 05 08 14 01 02 00 ② 11 D0 11 D1 11 D2 ③

11 00 11 01 11 02 15 E0 13 88 13 87 00 01 8F 80

④ ⑤ ⑥ CRC

① start time 0E 03 05 08 14 01 00 78

Year month day hour minute second millisecond

Start time：Mar. 5, 2014, 08:20:01:120

② end time 0E 03 05 08 14 01 02 00

Year month day hour minute second millisecond

End time：Mar. 5, 2014, 08:20:01:512

③ the voltage maximum(3P4W is phase voltage，3P3W is line voltage)

11 D0: 456.0 V；11 D1: 456.1 V；11 D2: 456.2 V；

④ the voltage minimum(3P4W is phase voltage，3P3W is line voltage)

11 00: 435.2 V；11 01: 435.3 V；11 02: 435.4 V；

⑤ the current maximum

15 E0: 5.600 A；13 88: 5.000 A；13 87: 4.999 A；

⑥ fault type

00 01: 1 over-voltage fault

Example：read fault wave record waveform data

Host request：01 14 07 06 00 06 00 01 00 50 20 D8

Slave response：01 14 A2 A1 06

XX … XX XX XX

① CRC

① waveform data XX … XX

80 bytes

Manually read wave record：

The meter can record and store 1 piece of manual wave record information. Start manual wave record by communication or key operation. It records the start time,

end time and the three-phase phase voltage, line voltage, current in the current grid. Manual wave record also stores 10 cycle waves of voltage and current data, with sampling rate 80 points/cycle.

Data format of manual wave record ：

Year month day hour minute second millisecond(start time)(8byte)+Year month day hour minute second millisecond(end time)(8byte)+three-phase phase voltage value(6byte)+three-phase line voltage value(6byte)+three-phase current value(6byte)+reserve(2byte)+the 1st cycle wave of V1(80 points data)(160byte)+the 1st cycle wave of V2(80 points data)(160byte)+the 1st cycle wave of V3(80 points data)(160byte)+the 1st cycle wave of I1(80 points data)(160byte)+the 1st cycle wave of I2(80 points data)(160byte)+the 1st cycle wave of I3(80 points data)(160byte)+the 2nd cycle wave of V1(80 points data)(160byte)+.....+the 10th cycle wave of I2(80 points data)(160byte)+the 10th cycle wave of I3(80 points data)(160byte)。

Start data：Year month day hour minute second millisecond(start time)(8byte)+Year month day hour minute second millisecond(end time)(8byte)+three-phase phase voltage value(6byte)+three-phase line voltage value(6byte)+three-phase current value(6byte)+reserve(2byte)

Waveform data：three-phase current has 10 cycle waves, and 80 data per cycle.

Example：read manual wave recorder information, the start time, end time andextreme values.

Host request：01 14 07 06 00 07 00 00 00 12 CC E9

Slave response：01 14 26 25 06

0E 03 05 08 14 01 00 78 ① 0E 03 05 08 14 01 02 00 ② 11 D0 11 D1 11 D2 ③

11 00 11 01 11 02 ④ 15 E0 13 88 13 87 ⑤ 00 01 ⑥ 8F 80 CRC

① start time 0E 03 05 08 14 01 00 78

Year month day hour minute second millisecond

Start time：Mar. 5, 2014, 08:20:01:120

② end time 0E 03 05 08 14 01 02 00

Year month day hour minute second millisecond

End time：Mar. 5, 2014, 08:20:01:512

③ the voltage maximum(3P4W is phase voltage，3P3W is line voltage)

11 D0: 456.0 V；11 D1: 456.1 V；11 D2: 456.2 V；

④ the voltage minimum(3P4W is phase voltage，3P3W is line voltage)

11 00: 435.2 V；11 01: 435.3 V；11 02: 435.4 V；

⑤ the current maximum

15 E0: 5.600 A；13 88: 5.000 A；13 87: 4.999 A；

⑥ reserve

Example：read manual wave record waveform data

Host request：01 14 07 06 00 07 00 01 00 50 1D 18

Slave response：01 14 A2 A1 06

XX … XX XX XX

① CRC

① waveform data XX … XX

80bytes

Read over-voltage event record：

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File number	Record number	File 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	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 bytes		2 bytes
Message example	0x01	0x14	0x14	0x13	0x06	Over-voltage record		CRC16

Over-voltage, under-voltage, over-current, under-current, overload, underload record

The meter can record up to 192 pieces of over-voltage, under-voltage, over-current, under-current, overload and underload record. It judges and process the current, voltage and power every 250ms. The meter records the start time, end time and the corresponding voltage, current or power extreme values during the event. The threshold and hysteresis of the voltage, current, power can be 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 of 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：Mar. 5, 2014, 08:20:01

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

Year month day hour minute second

End time：Mar. 5, 2014, 08:20:11

③ ④ ⑤：voltage maximum during over-voltage(3P4W is phase voltage，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；

Example of 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

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

Year month day hour minute second

Start time：Mar.5, 2014, 08:21:24

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

Year month day hour minute second

End time：Mar.5, 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；

Example of overload：

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

①overload start time 0E 03 05 08 15 30

Year month day hour minute second

Start time：Mar.5, 2014, 08:21:48

②overload end time 0E 03 05 08 15 32

Year month day hour minute second

End time：Mar.5, 2014, 08:21:50

③ ④ ⑤：the total active power, reactive power, apparent power maximum during overload.

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；

Read rapid voltage change event record:

Request								
Frame structure	Address code	Function code	Data code					Check code
			Byte counting	Parameter type	File number	Record number	Record 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	0x000e	0～15	11	CRC16
Message example	0x01	0x14	0x07	0x06	0x000e	0x0000	0x000B	0xD122
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	22 bytes	2 bytes
Message example	0x01	0x14	0x18	0x13	0x06	RVC record data	CRC16

The meter has 16 pieces of RVC event record. RVC record refers to IEC61000-4-30-2015 standard. The meter record the start time, end time, voltage channels, maximum voltage change, and steady-state voltage change. The steady-state threshold and dynamic threshold of RVC can be set by communication.

Data format of RVC record：

Channel+ Year month day hour minute second millisecond(start time)(8byte)+ Year month day hour minute second millisecond(end time)(8byte)+voltage extreme value(2byte)

Host request：01 14 07 06 00 0e 00 00 00 0b D1 22

Slave response：01 14 18 17 06

00 0E 03 05 08 14 01 00 78 0E 03 05 08 14 01 02 00 00 32 00 20

① ② ③ ④ ⑤

4B 84

CRC

② : channel type：00：V1 01:V2 02:V3

②over-voltage start time 0E 03 05 08 14 01 00 78

Year month day hour minute second millisecond

Start time：Mar. 5, 2014, 08:20:01:120

③over-voltage end time 0E 03 05 08 14 01 02 00

Year month day hour minute second millisecond

End time：Mar. 5, 2014, 08:20:01:512

④maximum voltage change during RVC events(secondary value 0.1V)：0032：

5.0V

⑤ steady-state voltage change during RVC events(secondary value 0.1V)：0020： 3.2V

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	----			R
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	Import Active Energy	kWh	R
003E-003F	Float	Export Active Energy	kWh	R
0040-0041	Float	Import Reactive Energy	kvarh	R
0042-0043	Float	Export Reactive Energy	kvarh	R
0044-0045	Float	Apparent Energy	kVA	R
0046-0047	Float	1st Quadrant Reactive Energy - EQL+	kvarh	R
0048-0049	Float	2nd Quadrant Reactive Energy - EQC+	kvarh	R
004A-004B	Float	3rd Quadrant Reactive Energy - EQL-	kvarh	R
004C-004D	Float	4th Quadrant Reactive Energy - EQC-	kvarh	R
004E-004F	Float	Fundamental Import Active Energy	kWh	R
0050-0051	Float	Fundamental Export Active Energy	kWh	R
0052-0053	Float	Fundamental Import Reactive Energy	kvarh	R
0054-0055	Float	Fundamental Export Reactive Energy	kvarh	R
0056-0057	Float	L1 Import Active Energy	kWh	R
0058-0059	Float	L2 Import Active Energy	kWh	R
005A-005B	Float	L3 Import Active Energy	kWh	R
005C-005D	Float	L1 Export Active Energy	kWh	R
005E-005F	Float	L2 Export Active Energy	kWh	R
0060-0061	Float	L3 Export Active Energy	kWh	R
0062-0063	Float	L1 Import Reactive Energy	kvarh	R
0064-0065	Float	L2 Import Reactive Energy	kvarh	R
0066-0067	Float	L3 Import Reactive Energy	kvarh	R
0068-0069	Float	L1 Export Reactive Energy	kvarh	R
006A-006B	Float	L2 Export Reactive Energy	kvarh	R
006C-006D	Float	L3 Export Reactive Energy	kvarh	R

006E-006F	Float	Total tariff import energy	kWh	R
0070-0071	Float	Tariff T1 import energy	kWh	R
0072-0073	Float	Tariff T2 import energy	kWh	R
0074-0075	Float	Tariff T3 import energy	kWh	R
0076-0077	Float	Tariff T4 import energy	kWh	R
0078-0079	Float	Total tariff import energy-Present month	kWh	R
007A-007B	Float	Tariff T1 import energy-Present month	kWh	R
007C-007D	Float	Tariff T2 import energy-Present month	kWh	R
007E-008F	Float	Tariff T3 import energy-Present month	kWh	R
0080-0081	Float	Tariff T4 import energy-Present month	kWh	R
0082-0083	Float	Total tariff import energy-Past 01st month	kWh	R
0084-0085	Float	Tariff T1 import energy- Past 01st month	kWh	R
0086-0087	Float	Tariff T2 import energy- Past 01st month	kWh	R
0088-0089	Float	Tariff T3 import energy- Past 01st month	kWh	R
008A-008B	Float	Tariff T4 import energy- Past 01st month	kWh	R
008C-008D	Float	Total tariff import energy-Past 02nd month	kWh	R
008E-008F	Float	Tariff T1 import energy- Past 02nd month	kWh	R
0090-0091	Float	Tariff T2 import energy- Past 02nd month	kWh	R
0092-0093	Float	Tariff T3 import energy- Past 02nd month	kWh	R
0094-0095	Float	Tariff T4 import energy- Past 02nd month	kWh	R
0096-0097	Float	Total tariff import energy-Past 03rd month	kWh	R
0098-0099	Float	Tariff T1 import energy- Past 03rd month	kWh	R
009A-009B	Float	Tariff T2 import energy- Past 03rd month	kWh	R
009C-009D	Float	Tariff T3 import energy- Past 03rd month	kWh	R
009E-009F	Float	Tariff T4 import energy- Past 03rd month	kWh	R
00A0-00A1	Float	Total tariff import energy-Past 04th month	kWh	R
00A2-00A3	Float	Tariff T1 import energy- Past 04th month	kWh	R
00A4-00A5	Float	Tariff T2 import energy- Past 04th month	kWh	R

00A6-00A7	Float	Tariff T3 import energy- Past 04th month	kWh	R
00A8-00A9	Float	Tariff T4 import energy- Past 04th month	kWh	R
00AA-00AB	Float	Total tariff import energy-Past 05th month	kWh	R
00AC-00AD	Float	Tariff T1 import energy- Past 05th month	kWh	R
00AE-00AF	Float	Tariff T2 import energy- Past 05th month	kWh	R
00B0-00B1	Float	Tariff T3 import energy- Past 05th month	kWh	R
00B2-00B3	Float	Tariff T4 import energy- Past 05th month	kWh	R
00B4-00B5	Float	Total tariff import energy-Past 06th month	kWh	R
00B6-007	Float	Tariff T1 import energy- Past 06th month	kWh	R
00B8-00B9	Float	Tariff T2 import energy- Past 06th month	kWh	R
00BA-00BB	Float	Tariff T3 import energy- Past 06th month	kWh	R
00BC-00BD	Float	Tariff T4 import energy- Past 06th month	kWh	R
00BE-00BF	Float	Total tariff import energy-Past 07th month	kWh	R
00C0-00C1	Float	Tariff T1 import energy- Past 07th month	kWh	R
00C2-00C3	Float	Tariff T2 import energy- Past 07th month	kWh	R
00C4-00C5	Float	Tariff T3 import energy- Past 07th month	kWh	R
00C6-00C7	Float	Tariff T4 import energy- Past 07th month	kWh	R
00C8-00C9	Float	Total tariff import energy-Past 08th month	kWh	R
00CA-00CB	Float	Tariff T1 import energy- Past 08th month	kWh	R
00CC-00CD	Float	Tariff T2 import energy- Past 08th month	kWh	R
00CE-00CF	Float	Tariff T3 import energy- Past 08th month	kWh	R
00D0-00D1	Float	Tariff T4 import energy- Past 08th month	kWh	R
00D2-00D3	Float	Total tariff import energy-Past 09th month	kWh	R
00D4-00D5	Float	Tariff T1 import energy- Past 09th month	kWh	R
00D6-00D7	Float	Tariff T2 import energy- Past 09th month	kWh	R
00D8-00D9	Float	Tariff T3 import energy- Past 09th month	kWh	R
00DA-00DB	Float	Tariff T4 import energy- Past 09th month	kWh	R
00DC-00DD	Float	Total tariff import energy-Past 10th month	kWh	R

00DE-00DF	Float	Tariff T1 import energy- Past 10th month	kWh	R
00E0-00E1	Float	Tariff T2 import energy- Past 10th month	kWh	R
00E2-00E3	Float	Tariff T3 import energy- Past 10th month	kWh	R
00E4-00E5	Float	Tariff T4 import energy- Past 10th month	kWh	R
00E6-00E7	Float	Total tariff import energy-Past 11th month	kWh	R
00E8-00E9	Float	Tariff T1 import energy- Past 11th month	kWh	R
00EA-00EB	Float	Tariff T2 import energy- Past 11th month	kWh	R
00EC-00ED	Float	Tariff T3 import energy- Past 11th month	kWh	R
00EE-00EF	Float	Tariff T4 import energy- Past 11th month	kWh	R

3.2 System status

Address	Format	Description	Unit	R/W
00F0	char	High byte: year, Low byte: month		R
00F1	char	High byte: day, Low byte: hour		R
00F2	char	High byte: minute, Low byte: second		R
00F3	char	High byte:week, Low byte: ----		R
00F4-00F5	Long	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
00F6-00F7	Long	State of digital input, 0: Off,1: On		R

		Bit0: main body-DI1 Bit1: main body-DI2 Bit2: X1-DI1 Bit3: X1-DI2 Bit4: X1-DI3 Bit5: X1-DI4 Bit6: X2-DI1 Bit7: X2-DI2 Bit8 :X2-DI3 Bit9: X2-DI4 Bit10: X3-DI1 Bit11: X3-DI2 Bit12: X3-DI3 Bit13: X3-DI4 Bit14: X4-DI1 Bit15: X4-DI2 Bit16: X4-DI3 Bit17: X4-DI4		
00F8	bit	System status: Bit0: Phase Sequence, 0: normal,1: abnormal Bit1: frequency status 0: normal,1: abnormal Bit2: Voltage qualification state, 0: normal,1: abnormal Bit3:---- Bit4: High voltage alarm 0: OFF, 1: ON Bit5: Low voltage alarm,		R

		0: OFF, 1: ON Bit6: High current alarm: 0: OFF, 1: ON Bit7: Low current alarm: 0: OFF, 1: ON Bit8: High active power alarm 0: OFF, 1: ON Bit9: low active power alarm 0: OFF, 1: ON		
00F9	Int	Bit0: X1 Extended status 0: OFF, 1: ON Bit1: X2 Extended status 0: OFF, 1: ON Bit2: X3 Extended status 0: OFF, 1: ON Bit3: X4 Extended status 0: OFF, 1: ON		R
00FA	Int	High byte: X1 Extended Module 0: no 1: FM1, 2: FM2, 3: FM3, 4: FM4, 5: FM5, 6: FM6, 7: FM7, 8: FM8, 9: FM9, 10: FM10,		R

		11: FM11,		
		Low byte: X2 Extended Module 0: no 1: FM1, 2: FM2, 3: FM3, 4: FM4, 5: FM5, 6: FM6, 7: FM7, 8: FM8, 9: FM9, 10: FM10, 11: FM11,		
00FB	Int	High byte: X3 Extended Module 0: no 1: FM1, 2: FM2, 3: FM3, 4: FM4, 5: FM5, 6: FM6, 7: FM7, 8: FM8, 9: FM9, 10: FM10, 11: FM11,		R
		Low byte: X4 Extended Module 0: no		

		1: FM1, 2: FM2, 3: FM3, 4: FM4, 5: FM5, 6: FM6, 7: FM7, 8: FM8, 9: FM9, 10: FM10, 11: FM11,		
00FC-00FF	----			

3.3 Max/Min data

Address	Format	Description	Unit	R/W
0100-0101	float	Max. value-V1	V	R
0102-0103	float	Max. value-V2	V	R
0104-0105	float	Max. value-V3	V	R
0106-0107	float	Max. value-V12	V	R
0108-0109	float	Max. value-V23	V	R
010A-010B	float	Max. value-V31	V	R
010C-010D	float	Max. value-I1	A	R
010E-010F	float	Max. value-I2	A	R
0110-0111	float	Max. value-I3	A	R
0112-0113	float	Max. value-In	A	R
0114-0115	float	Max. value-P	1W	R
0116-0117	float	Max. value-Q	kW	R
0118-0119	float	Max. value-S	kW	R
011A-011B	float	Max. value-PF	kW	R

011C-011D	float	Max. value-F	Hz	R
011E-011F	float	Min. value-V1	V	R
0120-0121	float	Min. value-V2	V	R
0122-0123	float	Min. value-V3	V	R
0124-0125	float	Min. value-V12	V	R
0126-0127	float	Min. value-V23	V	R
0128-0129	float	Min. value-V31	V	R
012A-012B	float	Min. value-I1	A	R
012C-012D	float	Min. value-I2	A	R
012E-012F	float	Min. value-I3	A	R
0130-0131	float	Min. value-In	A	R
0132-0133	float	Min. value-P	1W	R
0134-0135	float	Min. value-Q	kW	R
0136-0137	float	Min. value-S	kW	R
0138-0139	float	Min. value-PF	kW	R
013A-013B	float	Min. value-F	Hz	R
013C-013D	float	Present month Max. value-V1	V	R
013E-013F	float	Present month Max. value-V2	V	R
0140-0141	float	Present month Max. value-V3	V	R
0142-0143	float	Present month Max. value-V12	V	R
0144-0145	float	Present month Max. value-V23	V	R
0146-0147	float	Present month Max. value-V31	V	R
0148-0149	float	Present month Max. value-I1	A	R
014A-014B	float	Present month Max. value-I2	A	R
014C-014D	float	Present month Max. value-I3	A	R
014E-014F	float	Present month Max. value-In	A	R
0150-0151	float	Present month Max. value-P	kW	R
0152-0153	float	Present month Max. value-Q	kW	R

0154-0155	float	Present month Max. value-S	kW	R
0156-0157	float	Present month Max. value-PF	kW	R
0158-0159	float	Present month Max. value-F	Hz	R
015A-015B	float	Present month Min. value-V1	V	R
015C-015D	float	Present month Min. value-V2	V	R
015E-015F	float	Present month Min. value-V3	V	R
0160-0161	float	Present month Min. value-V12	V	R
0162-0163	float	Present month Min. value-V23	V	R
0164-0165	float	Present month Min. value-V31	V	R
0166-0167	float	Present month Min. value-I1	A	R
0168-0169	float	Present month Min. value-I2	A	R
016A-016B	float	Present month Min. value-I3	A	R
016C-016D	float	Present month Min. value-In	A	R
016E-016F	float	Present month Min. value-P	kW	R
0170-0171	float	Present month Min. value-Q	kW	R
0172-0173	float	Present month Min. value-S	kW	R
0174-0175	float	Present month Min. value-PF	kW	R
0176-0177	float	Present month Min. value-F	Hz	R
0178-0179	float	Past 01st month Max. value-V1	V	R
017A-017B	float	Past 01st month Max. value-V2	V	R
017C-017D	float	Past 01st month Max. value-V3	V	R
017E-017F	float	Past 01st month Max. value-V12	V	R
0180-0181	float	Past 01st month Max. value-V23	V	R
0182-0183	float	Past 01st month Max. value-V31	V	R
0184-0185	float	Past 01st month Max. value-I1	A	R
0186-0187	float	Past 01st month Max. value-I2	A	R
0188-0189	float	Past 01st month Max. value-I3	A	R
018A-018B	float	Past 01st month Max. value-In	A	R

018C-018D	float	Past 01st month Max. value-P	1W	R
018E-018F	float	Past 01st month Max. value-Q	kW	R
0190-0191	float	Past 01st month Max. value-S	kW	R
0192-0193	float	Past 01st month Max. value-PF	kW	R
0194-0195	float	Past 01st month Max. value-F	Hz	R
0196-0197	float	Past 01st month Min. value-V1	V	R
0198-0199	float	Past 01st month Min. value-V2	V	R
019A-019B	float	Past 01st month Min. value-V3	V	R
019C-019D	float	Past 01st month Min. value-V12	V	R
019E-019F	float	Past 01st month Min. value-V23	V	R
01A0-01A1	float	Past 01st month Min. value-V31	V	R
01A2-01A3	float	Past 01st month Min. value-I1	A	R
01A4-01A5	float	Past 01st month Min. value-I2	A	R
01A6-01A7	float	Past 01st month Min. value-I3	A	R
01A8-01A9	float	Past 01st month Min. value-In	A	R
01AA-01AB	float	Past 01st month Min. value-P	1W	R
01AC-01AD	float	Past 01st month Min. value-Q	kW	R
01AE-01AF	float	Past 01st month Min. value-S	kW	R
01B0-01B1	float	Past 01st month Min. value-PF	kW	R
01B2-01B3	float	Past 01st month Min. value-F	Hz	R
01B4-01B5	float	Past 02nd month Max. value-V1	V	R
01B6-01B7	float	Past 02nd month Max. value-V2	V	R
01B8-01B9	float	Past 02nd month Max. value-V3	V	R
01BA-01BB	float	Past 02nd month Max. value-V12	V	R
01BC-01BD	float	Past 02nd month Max. value-V23	V	R
01BE-01BF	float	Past 02nd month Max. value-V31	V	R
01C0-01C1	float	Past 02nd month Max. value-I1	A	R
01C2-01C3	float	Past 02nd month Max. value-I2	A	R

01C4-01C5	float	Past 02nd month Max. value-I3	A	R
01C6-01C7	float	Past 02nd month Max. value-In	A	R
01C8-01C9	float	Past 02nd month Max. value-P	1W	R
01CA-01CB	float	Past 02nd month Max. value-Q	kW	R
01CC-01CD	float	Past 02nd month Max. value-S	kW	R
01CE-01CF	float	Past 02nd month Max. value-PF	kW	R
01D0-01D1	float	Past 02nd month Max. value-F	Hz	R
01D2-01D3	float	Past 02nd month Min. value-V1	V	R
01D4-01D5	float	Past 02nd month Min. value-V2	V	R
01D6-01D7	float	Past 02nd month Min. value-V3	V	R
01D8-01D9	float	Past 02nd month Min. value-V12	V	R
01DA-01DB	float	Past 02nd month Min. value-V23	V	R
01DC-01DD	float	Past 02nd month Min. value-V31	V	R
01DE-01DF	float	Past 02nd month Min. value-I1	A	R
01E0-01E1	float	Past 02nd month Min. value-I2	A	R
01E2-01E3	float	Past 02nd month Min. value-I3	A	R
01E4-01E5	float	Past 02nd month Min. value-In	A	R
01E6-01E7	float	Past 02nd month Min. value-P	1W	R
01E8-01E9	float	Past 02nd month Min. value-Q	kW	R
01EA-01EB	float	Past 02nd month Min. value-S	kW	R
01EC-01ED	float	Past 02nd month Min. value-PF	kW	R
01EE-01EF	float	Past 02nd month Min. value-F	Hz	R

3.4 Module data

Address	Format	Description	Unit	R/W
0300-0304	----			
0305	Int	State of Digital Input,0: OFF,1: ON Bit0: main body-DI1 Bit1: main body-DI2		

0306	Int	State of digital input,0:FF,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
0307	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
0308	Int	X1-AO1	0.001mA	R

0309	Int	X1-AO2	0.001mA	R
030A	Int	X2-AO1	0.001mA	R
030B	Int	X2-AO2	0.001mA	R
030C	Int	X3-AO1	0.001mA	R
030D	Int	X3-AO2	0.001mA	R
030E	Int	X4-AO1	0.001mA	R
030F	Int	X4-AO2	0.001mA	R
0310	Int	X1-AI1	0.001mA	R
0311	Int	X1-AI2	0.001mA	R
0312	Int	X2-AI1	0.001mA	R
0313	Int	X2-AI2	0.001mA	R
0314	Int	X3-AI1	0.001mA	R
0315	Int	X3-AI2	0.001mA	R
0316	Int	X4-AI1	0.001mA	R
0317	Int	X4-AI2	0.001mA	R
0318-031F	Int	----		R
0320	Int	X1-T1	1℃	R
0321	Int	X1-T2	1℃	R
0322	Int	X2-T1	1℃	R
0323	Int	X2-T2	1℃	R
0324	Int	X3-T1	1℃	R
0325	Int	X3-T2	1℃	R
0326	Int	X4-T1	1℃	R
0327	Int	X4-T2	1℃	R
0328-0329	Long	X1-channel1 pulse counter		R
032A-032B	Long	X1-channel2 pulse counter		R
032C-032D	Long	X1-channel3 pulse counter		R
032E-032F	Long	X1-channel4 pulse counter		R

0330-0331	Long	X2-channel1 pulse counter		R
0332-0333	Long	X2-channel2 pulse counter		R
0334-0335	Long	X2-channel3 pulse counter		R
0336-0337	Long	X2-channel4 pulse counter		R
0338-0339	Long	X3-channel1 pulse counter		R
033A-033B	Long	X3-channel2 pulse counter		R
033C-033D	Long	X3-channel3 pulse counter		R
033E-033F	Long	X3-channel4 pulse counter		R
0340-0341	Long	X4-channel1 pulse counter		R
0342-0343	Long	X4-channel2 pulse counter		R
0344-0345	Long	X4-channel3 pulse counter		R
0346-0347	Long	X4-channel4 pulse counter		R
0348-0349	Long	Main boby-channel1 pulse counter		
034A-034B	Long	Main boby-channel2 pulse counter		
034C-03EF				
03F0	Int	The communication status of the module FM8 at the X1/X3 position. Bit0: 1- normal connection 0- abnormal connection Bit1-Bit15：----		R
03F1	Int	The communication status of the module FM8 at the X2/X4 position. Bit0: 1- normal connection 0- abnormal connection Bit1-Bit15----		R
03F2	Int	Ethernet Socket status: Bit0: 1: Socket1 establish connection 0: Close or monitor		R

		Bit1: 1: Socket2 establish connection 0: Close or monitor Bit2: 1: Socket3 establish connection 0: Close or monitor Bit3: 1: Socket4 establish connection 0: Close or monitor		
03F3	Int	High byte: ---- Low byte: WIFI connection status 0x31: connected, otherwise not connected		R
03F4	Int	GPRS work status: Bit0-Bit3: work mode, 0: GPRS only 1: SMS only 2: GPRS + SMS Bit4: GPRS connection status 0: GPRS not connected 1: GPRS connected		R
03F5	Int	GRPS Signal strength: 0-31 / 99 0: <=-113dBm 1:-111dBm 2--30: -109---53dBm 31:>= -53dBm 99: unknown		R
03F6	Int	Lora Signal strength		R
03F5-03FF	----			

3.5 Demand data

Address	Format	Description	Unit	R/W
0400-0401	float	Present demand value -I1	A	R
0402-0403	float	Present demand value -I2	A	R
0404-0405	float	Present demand value -I3	A	R
0406-0407	float	Present demand value -P	kW	R
0408-0409	float	Present demand value -Q	kvar	R
040A-040B	float	Present demand value -S	kVA	R
040C-040D	float	Previous demand value -I1	A	R
040E-040F	float	Previous demand value -I2	A	R
0410-0411	float	Previous demand value -I3	A	R
0412-0413	float	Previous demand value -P	kW	R
0414-0415	float	Previous demand value -Q	kvar	R
0416-0417	float	Previous demand value -S	kVA	R
0418-0419	float	Max. demand value -I1	A	R
041A-041B	float	Max. demand value -I2	A	R
041C-041D	float	Max. demand value -I3	A	R
041E-041F	float	Max. demand value -P	kW	R
0420-0421	float	Max. demand value -Q	kvar	R
0422-0423	float	Max. demand value -S	kVA	R
0424-0425	float	Present month Max. demand value -I1	A	R
0426-0427	float	Present month Max. demand value -I2	A	R
0428-0429	float	Present month Max. demand value -I3	A	R
042A-042B	float	Present month Max. demand value -P	kW	R
042C-042D	float	Present month Max. demand value -Q	kvar	R
042E-042F	float	Present month Max. demand value -S	kVA	R
0430-0431	float	Past 01st month Max. demand value -I1	A	R
0432-0433	float	Past 01st month Max. demand value -I2	A	R

0434-0435	float	Past 01st month Max. demand value -I3	A	R
0436-0437	float	Past 01st month Max. demand value -P	kW	R
0438-0439	float	Past 01st month Max. demand value -Q	kvar	R
043A-043B	float	Past 01st month Max. demand value -S	kVA	R
043C-043D	float	Past 02nd month Max. demand value -I1	A	R
043E-043F	float	Past 02nd month Max. demand value -I2	A	R
0440-0441	float	Past 02nd month Max. demand value -I3	A	R
0442-0443	float	Past 02nd month Max. demand value -P	kW	R
0444-0445	float	Past 02nd month Max. demand value -Q	kvar	R
0446-0447	float	Past 02nd month Max. demand value -S	kVA	R
0448-04EB	---			
04EA-04EB	Long	Number of communication reception		R
04EC-04ED	Long	Number of communication transmissions		R

3.6 Power Quality

Address	Format	Description	Unit	R/W
04EE-04EF	float	Positive-sequence component of voltage	V	R
04F0-04F1	float	Negative-sequence component of voltage	V	R
04F2-04F3	float	Zero-sequence component of voltage	V	R
04F4-04F5	float	Unbalance factor of voltage		R
04F6-04F7	float	Positive-sequence component of current	A	R
04F8-04F9	float	Negative-sequence component of current	A	R
04FA-04FB	float	Zero-sequence component of current	A	R
04FC-04FD	float	Unbalance factor of current		R
04FE-04FF	float	Average value -Vln	A	R
0500-0501	float	Average value -Vll	A	R
0502-0503	float	Average value -I	A	R
0504-0505	float	Average value -P	kW	R
0506-0507	float	Average value -Q	kvar	R

0508-0509	float	Average value -S	kVA	R
050A-050B	float	Deviation value -V1	V	R
050C-050D	float	Deviation value -V2	V	R
050E-050F	float	Deviation value -V3	V	R
0510-0511	float	Deviation value -V12	V	R
0512-0513	float	Deviation value -V23	V	R
0514-0515	float	Deviation value -V31	V	R
0516-0517	float	Deviation value -F	Hz	R
0518-0519	float	Fundamental value -V1	V	R
051A-051B	float	Fundamental value -V2	V	R
051C-051D	float	Fundamental value -V3	V	R
051E-051F	float	Fundamental value -I1	A	R
0520-0521	float	Fundamental value -I2	A	R
0522-0523	float	Fundamental value -I3	A	R
0524-0525	float	Harmonic content -V1	V	R
0526-0527	float	Harmonic content -V2	V	R
0528-0529	float	Harmonic content -V3	V	R
502A-052B	float	Harmonic content -I1	A	R
052C-052D	float	Harmonic content -I2	A	R
052E-052F	float	Harmonic content -I3	A	R
0530-0531	float	Fundamental value -P1	kW	R
0532-0533	float	Fundamental value -P2	kW	R
0534-0535	float	Fundamental value -P3	kW	R
0536-0537	float	Fundamental value -P1	kW	R
0538-0539	float	Fundamental value -Q1	kvar	R
053A-053B	float	Fundamental value -Q2	kvar	R
053C-053D	float	Fundamental value -Q3	kvar	R
053E-053F	float	Fundamental value -Q	kvar	R

0540-0541	float	Fundamental value -S1	kVA	R
0542-0543	float	Fundamental value -S2	kVA	R
0544-0545	float	Fundamental value -S3	kVA	R
0546-0547	float	Fundamental value -S	kVA	R
0548-0549	float	Fundamental value -PF1		R
054A-054B	float	Fundamental value -PF2		R
054C-054D	float	Fundamental value -PF3		R
054E-054F	float	Fundamental value -PF		R
0550-0551	Long	Meter running time	s	R
0552-0553	Long	Load running time	s	R
0554-0555	float	V1-Short term severity		R
0556-0557	float	V2-Short term severity		R
0558-0559	float	V3-Short term severity		R
055A-055B	float	V1-Long term severity		R
055C-055D	float	V2-Long term severity		R
055E-055F	float	V3-Long term severity		R
0560-0561	float	V1-Voltage fluctuation	V	R
0562-0563	float	V2-Voltage fluctuation	V	R
0564-0565	float	V3-Voltage fluctuation	V	R
0566-0567	float	L1 RVC	V	R
0568-0569	float	L2 RVC	V	R
056A-056B	float	L3 RVC	V	R
056C	Int	Phase angle of V1(default 0°)	0.1°	R
056D	Int	Phase angle of V2	0.1°	R
056E	Int	Phase angle of V3	0.1°	R
056F	Int	Phase angle of I1	0.1°	R
0570	Int	Phase angle of I2	0.1°	R
0571	Int	Phase angle of I3	0.1°	R

0572	Int	Crest factor V1	0.001	R
0573	Int	Crest factor V2	0.001	R
0574	Int	Crest factor V3	0.001	R
0575	Int	K-factor I1	0.001	R
0576	Int	K-factor I2	0.001	R
0577	Int	K-factor I3	0.001	R
0578-057A	Int	----		
057B	Int	derating factor of transformer	0.1%	R
057C	Int	Load percentage - I1	0.1%	R
057D	Int	Load percentage - I2	0.1%	R
057E	Int	Load percentage - I3	0.1%	R
057F	Int	Load percentage - P	0.1%	R
0580	Int	Voltage qualification rate	0.1%	R
0581	Int	Frequency qualification rate	0.1%	R
0582	Int	THD-V1	0.01%	R
0583	Int	THD-V2	0.01%	R
0584	Int	THD-V3	0.01%	R
0585	Int	THD-I1	0.01%	R
0586	Int	THD-I2	0.01%	R
0587	Int	THD-I3	0.01%	R
0588	Int	2nd harmonic ratio-V1	0.01%	R
0589	Int	2nd harmonic ratio-V2	0.01%	R
058A	Int	2nd harmonic ratio-V3	0.01%	R
058B	Int	2nd harmonic ratio-I1	0.01%	R
058C	Int	2nd harmonic ratio-I2	0.01%	R
058D	Int	2nd harmonic ratio-I3	0.01%	R
058E	Int	3rd harmonic ratio-V1	0.01%	R
058F	Int	3rd harmonic ratio-V2	0.01%	R

0590	Int	3rd harmonic ratio-V3	0.01%	R
0591	Int	3rd harmonic ratio-I1	0.01%	R
0592	Int	3rd harmonic ratio-I2	0.01%	R
0593	Int	3rd harmonic ratio-I3	0.01%	R
0594	Int	4th harmonic ratio-V1	0.01%	R
0595	Int	4th harmonic ratio-V2	0.01%	R
0596	Int	4th harmonic ratio-V3	0.01%	R
0597	Int	4th harmonic ratio-I1	0.01%	R
0598	Int	4th harmonic ratio-I2	0.01%	R
0599	Int	4th harmonic ratio-I3	0.01%	R
059A	Int	5th harmonic ratio-V1	0.01%	R
059B	Int	5th harmonic ratio-V2	0.01%	R
059C	Int	5th harmonic ratio-V3	0.01%	R
059D	Int	5th harmonic ratio-I1	0.01%	R
059E	Int	5th harmonic ratio-I2	0.01%	R
059F	Int	5th harmonic ratio-I3	0.01%	R
05A0	Int	6th harmonic ratio-V1	0.01%	R
05A1	Int	6th harmonic ratio-V2	0.01%	R
05A2	Int	6th harmonic ratio-V3	0.01%	R
05A3	Int	6th harmonic ratio-I1	0.01%	R
05A4	Int	6th harmonic ratio-I2	0.01%	R
05A5	Int	6th harmonic ratio-I3	0.01%	R
05A6	Int	7th harmonic ratio-V1	0.01%	R
05A7	Int	7th harmonic ratio-V2	0.01%	R
05A8	Int	7th harmonic ratio-V3	0.01%	R
05A9	Int	7th harmonic ratio-I1	0.01%	R
05AA	Int	7th harmonic ratio-I2	0.01%	R
05AB	Int	7th harmonic ratio-I3	0.01%	R

05AC	Int	8th harmonic ratio-V1	0.01%	R
05AD	Int	8th harmonic ratio-V2	0.01%	R
05AE	Int	8th harmonic ratio-V3	0.01%	R
05AF	Int	8th harmonic ratio-I1	0.01%	R
05B0	Int	8th harmonic ratio-I2	0.01%	R
05B1	Int	8th harmonic ratio-I3	0.01%	R
05B2	Int	9th harmonic ratio-V1	0.01%	R
05B3	Int	9th harmonic ratio-V2	0.01%	R
05B4	Int	9th harmonic ratio-V3	0.01%	R
05B5	Int	9th harmonic ratio-I1	0.01%	R
05B6	Int	9th harmonic ratio-I2	0.01%	R
05B7	Int	9th harmonic ratio-I3	0.01%	R
05B8	Int	10th harmonic ratio-V1	0.01%	R
05B9	Int	10th harmonic ratio-V2	0.01%	R
05BA	Int	10th harmonic ratio-V3	0.01%	R
05BB	Int	10th harmonic ratio-I1	0.01%	R
05BC	Int	10th harmonic ratio-I2	0.01%	R
05BD	Int	10th harmonic ratio-I3	0.01%	R
05BE	Int	11th harmonic ratio-V1	0.01%	R
05BF	Int	11th harmonic ratio-V2	0.01%	R
05C0	Int	11th harmonic ratio-V3	0.01%	R
05C1	Int	11th harmonic ratio-I1	0.01%	R
05C2	Int	11th harmonic ratio-I2	0.01%	R
05C3	Int	11th harmonic ratio-I3	0.01%	R
05C4	Int	12th harmonic ratio-V1	0.01%	
05C5	Int	12th harmonic ratio-V2	0.01%	R
05C6	Int	12th harmonic ratio-V3	0.01%	R
05C7	Int	12th harmonic ratio-I1	0.01%	R

05C8	Int	12th harmonic ratio-I2	0.01%	R
05C9	Int	12th harmonic ratio-I3	0.01%	R
05CA	Int	13th harmonic ratio-V1	0.01%	R
05CB	Int	13th harmonic ratio-V2	0.01%	R
05CC	Int	13th harmonic ratio-V3	0.01%	R
05CD	Int	13th harmonic ratio-I1	0.01%	R
05CE	Int	13th harmonic ratio-I2	0.01%	R
05CF	Int	13th harmonic ratio-I3	0.01%	R
05D0	Int	14th harmonic ratio-V1	0.01%	R
05D1	Int	14th harmonic ratio-V2	0.01%	R
05D2	Int	14th harmonic ratio-V3	0.01%	R
05D3	Int	14th harmonic ratio-I1	0.01%	R
05D4	Int	14th harmonic ratio-I2	0.01%	R
05D5	Int	14th harmonic ratio-I3	0.01%	R
05D6	Int	15th harmonic ratio-V1	0.01%	R
05D7	Int	15th harmonic ratio-V2	0.01%	R
05D8	Int	15th harmonic ratio-V3	0.01%	R
05D9	Int	15th harmonic ratio-I1	0.01%	R
05DA	Int	15th harmonic ratio-I2	0.01%	R
05DB	Int	15th harmonic ratio-I3	0.01%	R
05DC	Int	16th harmonic ratio-V1	0.01%	R
05DD	Int	16th harmonic ratio-V2	0.01%	R
05DE	Int	16th harmonic ratio-V3	0.01%	R
05DF	Int	16th harmonic ratio-I1	0.01%	R
05E0	Int	16th harmonic ratio-I2	0.01%	R
05E1	Int	16th harmonic ratio-I3	0.01%	R
05E2	Int	17th harmonic ratio-V1	0.01%	R
05E3	Int	17th harmonic ratio-V2	0.01%	R

05E4	Int	17th harmonic ratio-V3	0.01%	R
05E5	Int	17th harmonic ratio-I1	0.01%	R
05E6	Int	17th harmonic ratio-I2	0.01%	R
05E7	Int	17th harmonic ratio-I3	0.01%	R
05E8	Int	18th harmonic ratio-V1	0.01%	R
05E9	Int	18th harmonic ratio-V2	0.01%	R
05EA	Int	18th harmonic ratio-V3	0.01%	R
05EB	Int	18th harmonic ratio-I1	0.01%	R
05EC	Int	18th harmonic ratio-I2	0.01%	R
05ED	Int	18th harmonic ratio-I3	0.01%	R
05EE	Int	19th harmonic ratio-V1	0.01%	R
05EF	Int	19th harmonic ratio-V2	0.01%	R
05F0	Int	19th harmonic ratio-V3	0.01%	R
05F1	Int	19th harmonic ratio-I1	0.01%	R
05F2	Int	19th harmonic ratio-I2	0.01%	R
05F3	Int	19th harmonic ratio-I3	0.01%	R
05F4	Int	20th harmonic ratio-V1	0.01%	R
05F5	Int	20th harmonic ratio-V2	0.01%	R
05F6	Int	20th harmonic ratio-V3	0.01%	R
05F7	Int	20th harmonic ratio-I1	0.01%	R
05F8	Int	20th harmonic ratio-I2	0.01%	R
05F9	Int	20th harmonic ratio-I3	0.01%	R
05FA	Int	21st harmonic ratio-V1	0.01%	R
05FB	Int	21st harmonic ratio-V2	0.01%	R
05FC	Int	21st harmonic ratio-V3	0.01%	R
05FD	Int	21st harmonic ratio-I1	0.01%	R
05FE	Int	21st harmonic ratio-I2	0.01%	R
05FF	Int	21st harmonic ratio-I3	0.01%	R

0600	Int	22nd harmonic ratio-V1	0.01%	R
0601	Int	22nd harmonic ratio-V2	0.01%	R
0602	Int	22nd harmonic ratio-V3	0.01%	R
0603	Int	22nd harmonic ratio-I1	0.01%	R
0604	Int	22nd harmonic ratio-I2	0.01%	R
0605	Int	22nd harmonic ratio-I3	0.01%	R
0606	Int	23rd harmonic ratio-V1	0.01%	R
0607	Int	23rd harmonic ratio-V2	0.01%	R
0608	Int	23rd harmonic ratio-V3	0.01%	R
0609	Int	23rd harmonic ratio-I1	0.01%	R
060A	Int	23rd harmonic ratio-I2	0.01%	R
060B	Int	23rd harmonic ratio-I3	0.01%	R
060C	Int	24th harmonic ratio-V1	0.01%	R
060D	Int	24th harmonic ratio-V2	0.01%	R
060E	Int	24th harmonic ratio-V3	0.01%	R
060F	Int	24th harmonic ratio-I1	0.01%	R
0610	Int	24th harmonic ratio-I2	0.01%	R
0611	Int	24th harmonic ratio-I3	0.01%	R
0612	Int	25th harmonic ratio-V1	0.01%	R
0613	Int	25th harmonic ratio-V2	0.01%	R
0614	Int	25th harmonic ratio-V3	0.01%	R
0615	Int	25th harmonic ratio-I1	0.01%	R
0616	Int	25th harmonic ratio-I2	0.01%	R
0617	Int	25th harmonic ratio-I3	0.01%	R
0618	Int	26th harmonic ratio-V1	0.01%	R
0619	Int	26th harmonic ratio-V2	0.01%	R
061A	Int	26th harmonic ratio-V3	0.01%	R
061B	Int	26th harmonic ratio-I1	0.01%	R

061C	Int	26th harmonic ratio-I2	0.01%	R
061D	Int	26th harmonic ratio-I3	0.01%	R
061E	Int	27th harmonic ratio-V1	0.01%	R
061F	Int	27th harmonic ratio-V2	0.01%	R
0620	Int	27th harmonic ratio-V3	0.01%	R
0621	Int	27th harmonic ratio-I1	0.01%	R
0622	Int	27th harmonic ratio-I2	0.01%	R
0623	Int	27th harmonic ratio-I3	0.01%	R
0624	Int	28th harmonic ratio-V1	0.01%	R
0625	Int	28th harmonic ratio-V2	0.01%	R
0626	Int	28th harmonic ratio-V3	0.01%	R
0627	Int	28th harmonic ratio-I1	0.01%	R
0628	Int	28th harmonic ratio-I2	0.01%	R
0629	Int	28th harmonic ratio-I3	0.01%	R
062A	Int	29th harmonic ratio-V1	0.01%	R
062B	Int	29th harmonic ratio-V2	0.01%	R
062C	Int	29th harmonic ratio-V3	0.01%	R
062D	Int	29th harmonic ratio-I1	0.01%	R
062E	Int	29th harmonic ratio-I2	0.01%	R
062F	Int	29th harmonic ratio-I3	0.01%	R
0630	Int	30th harmonic ratio-V1	0.01%	R
0631	Int	30th harmonic ratio-V2	0.01%	R
0632	Int	30th harmonic ratio-V3	0.01%	R
0633	Int	30th harmonic ratio-I1	0.01%	R
0634	Int	30th harmonic ratio-I2	0.01%	R
0635	Int	30th harmonic ratio-I3	0.01%	R
0636	Int	31st harmonic ratio-V1	0.01%	R
0637	Int	31st harmonic ratio-V2	0.01%	R

0638	Int	31st harmonic ratio-V3	0.01%	R
0639	Int	31st harmonic ratio-I1	0.01%	R
063A	Int	31st harmonic ratio-I2	0.01%	R
063B	Int	31st harmonic ratio-I3	0.01%	R
063C	Int	32nd harmonic ratio-V1	0.01%	R
063D	Int	32nd harmonic ratio-V2	0.01%	R
063E	Int	32nd harmonic ratio-V3	0.01%	R
063F	Int	32nd harmonic ratio-I1	0.01%	R
0640	Int	32nd harmonic ratio-I2	0.01%	R
0641	Int	32nd harmonic ratio-I3	0.01%	R
0642	Int	33rd harmonic ratio-V1	0.01%	R
0643	Int	33rd harmonic ratio-V2	0.01%	R
0644	Int	33rd harmonic ratio-V3	0.01%	R
0645	Int	33rd harmonic ratio-I1	0.01%	R
0646	Int	33rd harmonic ratio-I2	0.01%	R
0647	Int	33rd harmonic ratio-I3	0.01%	R
0648	Int	34th harmonic ratio-V1	0.01%	R
0649	Int	34th harmonic ratio-V2	0.01%	R
064A	Int	34th harmonic ratio-V3	0.01%	R
064B	Int	34th harmonic ratio-I1	0.01%	R
064C	Int	34th harmonic ratio-I2	0.01%	R
064D	Int	34th harmonic ratio-I3	0.01%	R
064E	Int	35th harmonic ratio-V1	0.01%	R
064F	Int	35th harmonic ratio-V2	0.01%	R
0650	Int	35th harmonic ratio-V3	0.01%	R
0651	Int	35th harmonic ratio-I1	0.01%	R
0652	Int	35th harmonic ratio-I2	0.01%	R
0653	Int	35th harmonic ratio-I3	0.01%	R

0654	Int	36th harmonic ratio-V1	0.01%	R
0655	Int	36th harmonic ratio-V2	0.01%	R
0656	Int	36th harmonic ratio-V3	0.01%	R
0657	Int	36th harmonic ratio-I1	0.01%	R
0658	Int	36th harmonic ratio-I2	0.01%	R
0659	Int	36th harmonic ratio-I3	0.01%	R
065A	Int	37th harmonic ratio-V1	0.01%	R
065B	Int	37th harmonic ratio-V2	0.01%	R
065C	Int	37th harmonic ratio-V3	0.01%	R
065D	Int	37th harmonic ratio-I1	0.01%	R
065E	Int	37th harmonic ratio-I2	0.01%	R
065F	Int	37th harmonic ratio-I3	0.01%	R
0660	Int	38th harmonic ratio-V1	0.01%	R
0661	Int	38th harmonic ratio-V2	0.01%	R
0662	Int	38th harmonic ratio-V3	0.01%	R
0663	Int	38th harmonic ratio-I1	0.01%	R
0664	Int	38th harmonic ratio-I2	0.01%	R
0665	Int	38th harmonic ratio-I3	0.01%	R
0666	Int	39th harmonic ratio-V1	0.01%	R
0667	Int	39th harmonic ratio-V2	0.01%	R
0668	Int	39th harmonic ratio-V3	0.01%	R
0669	Int	39th harmonic ratio-I1	0.01%	R
066A	Int	39th harmonic ratio-I2	0.01%	R
066B	Int	39th harmonic ratio-I3	0.01%	R
066C	Int	40th harmonic ratio-V1	0.01%	R
066D	Int	40th harmonic ratio-V2	0.01%	R
066E	Int	40th harmonic ratio-V3	0.01%	R
066F	Int	40th harmonic ratio-I1	0.01%	R

0670	Int	40th harmonic ratio-I2	0.01%	R
0671	Int	40th harmonic ratio-I3	0.01%	R
0672	Int	41st harmonic ratio-V1	0.01%	R
0673	Int	41st harmonic ratio-V2	0.01%	R
0674	Int	41st harmonic ratio-V3	0.01%	R
0675	Int	41st harmonic ratio-I1	0.01%	R
0676	Int	41st harmonic ratio-I2	0.01%	R
0677	Int	41st harmonic ratio-I3	0.01%	R
0678	Int	42nd harmonic ratio-V1	0.01%	R
0679	Int	42nd harmonic ratio-V2	0.01%	R
067A	Int	42nd harmonic ratio-V3	0.01%	R
067B	Int	42nd harmonic ratio-I1	0.01%	R
067C	Int	42nd harmonic ratio-I2	0.01%	R
067D	Int	42nd harmonic ratio-I3	0.01%	R
067E	Int	43rd harmonic ratio-V1	0.01%	R
067F	Int	43rd harmonic ratio-V2	0.01%	R
0680	Int	43rd harmonic ratio-V3	0.01%	R
0681	Int	43rd harmonic ratio-I1	0.01%	R
0682	Int	43rd harmonic ratio-I2	0.01%	R
0683	Int	43rd harmonic ratio-I3	0.01%	R
0684	Int	44th harmonic ratio-V1	0.01%	R
0685	Int	44th harmonic ratio-V2	0.01%	R
0686	Int	44th harmonic ratio-V3	0.01%	R
0687	Int	44th harmonic ratio-I1	0.01%	R
0688	Int	44th harmonic ratio-I2	0.01%	R
0689	Int	44th harmonic ratio-I3	0.01%	R
068A	Int	45th harmonic ratio-V1	0.01%	R
068B	Int	45th harmonic ratio-V2	0.01%	R

068C	Int	45th harmonic ratio-V3	0.01%	R
068D	Int	45th harmonic ratio-I1	0.01%	R
068E	Int	45th harmonic ratio-I2	0.01%	R
068F	Int	45th harmonic ratio-I3	0.01%	R
0690	Int	46th harmonic ratio-V1	0.01%	R
0691	Int	46th harmonic ratio-V2	0.01%	R
0692	Int	46th harmonic ratio-V3	0.01%	R
0693	Int	46th harmonic ratio-I1	0.01%	R
0694	Int	46th harmonic ratio-I2	0.01%	R
0695	Int	46th harmonic ratio-I3	0.01%	R
0696	Int	47th harmonic ratio-V1	0.01%	R
0697	Int	47th harmonic ratio-V2	0.01%	R
0698	Int	47th harmonic ratio-V3	0.01%	R
0699	Int	47th harmonic ratio-I1	0.01%	R
069A	Int	47th harmonic ratio-I2	0.01%	R
069B	Int	47th harmonic ratio-I3	0.01%	R
069C	Int	48th harmonic ratio-V1	0.01%	R
069D	Int	48th harmonic ratio-V2	0.01%	R
069E	Int	48th harmonic ratio-V3	0.01%	R
069F	Int	48th harmonic ratio-I1	0.01%	R
06A0	Int	48th harmonic ratio-I2	0.01%	R
06A1	Int	48th harmonic ratio-I3	0.01%	R
06A2	Int	49th harmonic ratio-V1	0.01%	R
06A3	Int	49th harmonic ratio-V2	0.01%	R
06A4	Int	49th harmonic ratio-V3	0.01%	R
06A5	Int	49th harmonic ratio-I1	0.01%	R
06A6	Int	49th harmonic ratio-I2	0.01%	R
06A7	Int	49th harmonic ratio-I3	0.01%	R

06A8	Int	50th harmonic ratio-V1	0.01%	R
06A9	Int	50th harmonic ratio-V2	0.01%	R
06AA	Int	50th harmonic ratio-V3	0.01%	R
06AB	Int	50th harmonic ratio-I1	0.01%	R
06AC	Int	50th harmonic ratio-I2	0.01%	R
06AD	Int	50th harmonic ratio-I3	0.01%	R
06AE	Int	51st harmonic ratio-V1	0.01%	R
06AF	Int	51st harmonic ratio-V2	0.01%	R
06B0	Int	51st harmonic ratio-V3	0.01%	R
06B1	Int	51st harmonic ratio-I1	0.01%	R
06B2	Int	51st harmonic ratio-I2	0.01%	R
06B3	Int	51st harmonic ratio-I3	0.01%	R
06B4	Int	52nd harmonic ratio-V1	0.01%	R
06B5	Int	52nd harmonic ratio-V2	0.01%	R
06B6	Int	52nd harmonic ratio-V3	0.01%	R
06B7	Int	52nd harmonic ratio-I1	0.01%	R
06B8	Int	52nd harmonic ratio-I2	0.01%	R
06B9	Int	52nd harmonic ratio-I3	0.01%	R
06BA	Int	53rd harmonic ratio-V1	0.01%	R
06BB	Int	53rd harmonic ratio-V2	0.01%	R
06BC	Int	53rd harmonic ratio-V3	0.01%	R
06BD	Int	53rd harmonic ratio-I1	0.01%	R
06BE	Int	53rd harmonic ratio-I2	0.01%	R
06BF	Int	53rd harmonic ratio-I3	0.01%	R
06C0	Int	54th harmonic ratio-V1	0.01%	R
06C1	Int	54th harmonic ratio-V2	0.01%	R
06C2	Int	54th harmonic ratio-V3	0.01%	R
06C3	Int	54th harmonic ratio-I1	0.01%	R

06C4	Int	54th harmonic ratio-I2	0.01%	R
06C5	Int	54th harmonic ratio-I3	0.01%	R
06C6	Int	55th harmonic ratio-V1	0.01%	R
06C7	Int	55th harmonic ratio-V2	0.01%	R
06C8	Int	55th harmonic ratio-V3	0.01%	R
06C9	Int	55th harmonic ratio-I1	0.01%	R
06CA	Int	55th harmonic ratio-I2	0.01%	R
06CB	Int	55th harmonic ratio-I3	0.01%	R
06CC	Int	56th harmonic ratio-V1	0.01%	R
06CD	Int	56th harmonic ratio-V2	0.01%	R
06CE	Int	56th harmonic ratio-V3	0.01%	R
06CF	Int	56th harmonic ratio-I1	0.01%	R
06D0	Int	56th harmonic ratio-I2	0.01%	R
06D1	Int	56th harmonic ratio-I3	0.01%	R
06D2	Int	57th harmonic ratio-V1	0.01%	R
06D3	Int	57th harmonic ratio-V2	0.01%	R
06D4	Int	57th harmonic ratio-V3	0.01%	R
06D5	Int	57th harmonic ratio-I1	0.01%	R
06D6	Int	57th harmonic ratio-I2	0.01%	R
06D7	Int	57th harmonic ratio-I3	0.01%	R
06D8	Int	58th harmonic ratio-V1	0.01%	R
06D9	Int	58th harmonic ratio-V2	0.01%	R
06DA	Int	58th harmonic ratio-V3	0.01%	R
06DB	Int	58th harmonic ratio-I1	0.01%	R
06DC	Int	58th harmonic ratio-I2	0.01%	R
06DD	Int	58th harmonic ratio-I3	0.01%	R
06DE	Int	59th harmonic ratio-V1	0.01%	R
06DF	Int	59th harmonic ratio-V2	0.01%	R

06E0	Int	59th harmonic ratio-V3	0.01%	R
06E1	Int	59th harmonic ratio-I1	0.01%	R
06E2	Int	59th harmonic ratio-I2	0.01%	R
06E3	Int	59th harmonic ratio-I3	0.01%	R
06E4	Int	60th harmonic ratio-V1	0.01%	R
06E5	Int	60th harmonic ratio-V2	0.01%	R
06E6	Int	60th harmonic ratio-V3	0.01%	R
06E7	Int	60th harmonic ratio-I1	0.01%	R
06E8	Int	60th harmonic ratio-I2	0.01%	R
06E9	Int	60th harmonic ratio-I3	0.01%	R
06EA	Int	61st harmonic ratio-V1	0.01%	R
06EB	Int	61st harmonic ratio-V2	0.01%	R
06EC	Int	61st harmonic ratio-V3	0.01%	R
06ED	Int	61st harmonic ratio-I1	0.01%	R
06EE	Int	61st harmonic ratio-I2	0.01%	R
06EF	Int	61st harmonic ratio-I3	0.01%	R
06F0	Int	62nd harmonic ratio-V1	0.01%	R
06F1	Int	62nd harmonic ratio-V2	0.01%	R
06F2	Int	62nd harmonic ratio-V3	0.01%	R
06F3	Int	62nd harmonic ratio-I1	0.01%	R
06F4	Int	62nd harmonic ratio-I2	0.01%	R
06F5	Int	62nd harmonic ratio-I3	0.01%	R
06F6	Int	63rd harmonic ratio-V1	0.01%	R
06F7	Int	63rd harmonic ratio-V2	0.01%	R
06F8	Int	63rd harmonic ratio-V3	0.01%	R
06F9	Int	63rd harmonic ratio-I1	0.01%	R
06FA	Int	63rd harmonic ratio-I2	0.01%	R
06FB	Int	63rd harmonic ratio-I3	0.01%	R

3.7 Production information

Address	Format	Description1	Description2	R/W
0700-070F	Char	Meter type（ASCII）		R
0710-071F	Char	Software version（ASCII）		R
0720-073F	Int	V1 real-time waveform data(32 point)		R
0740-075F	Int	V2 real-time waveform data(32 point)		R
0760-077F	Int	V3 real-time waveform data(32 point)		R
0780-079F	Int	I1 real-time waveform data(32 point)		R
07A0-07BF	Int	I2 real-time waveform data(32 point)		R
07C0-07DF	Int	I3 real-time waveform data(32 point)		R

3.8 Event record

Address	Format	Description1	Description2	R/W
07E0	Int	High byte: year, Low byte: month	Record: Power On	R
07E1	Int	High byte: day, Low byte: hour		R
07E2	Int	High byte: minute, Low byte: second		R
07E3	Int	Power On Number		R
07E4	Int	High byte: year, Low byte: month	Record: Power Off	R
07E5	Int	High byte: day, Low byte: hour		R
07E6	Int	High byte: minute, Low byte: second		R

07E7	Int	Power Off Number		R
07E8	Int	High byte: year, Low byte: month	Record: Setup parameter	R
07E9	Int	High byte: day, Low byte: hour		R
07EA	Int	High byte: minute, Low byte: second		R
07EB	Int	Setup parameter Number		R
07EC	Int	High byte: year, Low byte: month	Record: Clear demand	R
07ED	Int	High byte: day, Low byte: hour		R
07EE	Int	High byte: minute, Low byte: second		R
07EF	Int	Clear demand Number		R
07F0	Int	High byte: year, Low byte: month	Record: Clear energy	R
07F1	Int	High byte: day, Low byte: hour		R
07F2	Int	High byte: minute, Low byte: second		R
07F3	Int	Clear energy Number		R
07F4	Int	High byte: Over voltage record number Low byte: ----		R
07F5	Int	High byte: under voltage record number Low byte: ----		R
07F6	Int	High byte: Over current record number Low byte: ----		R
07F7	Int	High byte: under current record number Low byte: ----		R

07F8	Int	High byte: Over active power record number Low byte: ----		R
07F9	Int	High byte: under active power record number Low byte: ----		R
07FA	Int	High byte: SOE event record number Low byte: ----		R
07FB	Int	High byte: Voltage swell record record number Low byte: ----		R
07FC	Int	High byte: Voltage dip record record number Low byte: ----		R
07FD	Int	High byte: Voltage interrupt record number Low byte: ----		R
07FE	Int	High byte: frequency of RVC event record Low byte: ----		R
07FF	Int	Total number of RVC off-limit		R

3.9 Setup Parameters

Address	Format	Description1	Description2	R/W
0800	Int	Main body: Slave address	1-247	R/W
0801	Int	Main body: Baud rate	0: 1200bps 1: 2400bps 2: 4800bps	R/W

			3: 9600bps 4: 19200bps	
0802	Int	Main body: Data format	0: N,8,1 1: E,8,1 2: O,8,1 3: N,8,2	R/W
0803	Int	----		
0804	Int	High byte: Wiring	0: 3P4W 1: 3P3W 2: 1P2W	R/W
		Low byte: Grid frequency	0: 50Hz 1: 60Hz	R/W
0805	Int	PT secondary	1～660V	R/W
0806	Int	CT secondary	1～6A	R/W
0807	Int	Neutral current secondary	1～6A	R/W
0808-0809	Long	PT primary	1～999999V	R/W
080A-080B	Long	CT primary	1～999999A	R/W
080C-080D	Long	Neutral current primary	1～999999A	R/W
080E	Int	Demand item of first to sixth channel	0:IPQS（fixed） Include six electric parameters which are I1 I2,I3,P,Q,S	R
080F	Int	Mode of demand	0: sliding block mode 1: fixed block mode	R/W
0810	Int	Sliding time(t)	1-9999s	R/W
0811	Int	Demand period(T)	(1-30)×t	R/W
0812	Int		0.1V（secondary）	R/W
0813	Int		0.1V（secondary）	R/W

0814	Int		0.01Hz	R/W
0815	Int		0.01Hz	R/W
0816	Int	Relay output Main body-DO1 mode	0: OFF 1: alarm 2: remote control	R/W
0817	Int	Relay output Main body-DO1 Pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
0818	Int	Relay output Main body-DO1 Alarm item select	Alarm Item: 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:Vlnavg > 17:Vlnavg < 18:Vllavg > 19:Vllavg <	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: Present demand value -I1 > 51: Present demand value -I1 < 52: Present demand value –I2 > 53: Present demand value –I2 < 54: Present demand value –I3 > 55: Present demand value –I3 < 56: Present demand value –I > 57: Present demand value –I < 58: Present demand value –P > 59: Present demand value –P < 60: Present demand value –Q > 61: Present demand value –Q < 62: Present demand value –S > 63: Present demand value –S <	

			64: X1-Pt100-1 > 65: X1-Pt100-1 < 66: X1-Pt100-2 > 67: X1-Pt100-2 < 68: X1-Pt100 > 69: X1-Pt100 < 70: X2-Pt100-1 > 71: X2-Pt100-1 < 72: X2-Pt100-2 > 73: X2-Pt100-2 < 74: X2-Pt100 > 75: X2-Pt100 < 76:X3-Pt100-1 > 77: X3-Pt100-1 < 78: X3-Pt100-2 > 79: X3-Pt100-2 < 80: X3-Pt100 > 81: X3-Pt100 < 82: X4-Pt100-1 > 83: X4-Pt100-1 < 84:X4-Pt100-2 > 85: X4-Pt100-2 < 86: X4-Pt100 > 87: X4-Pt100 < 88: DI，When the digital input is1,the relay closes.	
0819	Int	Relay output Main body-DO1 limit value	Secondary grid data, ratio: Voltage: 0.1V,	R/W

			Current: 0.001A Power: 1W/var/VA PF: 0.001 F: 0.01Hz Uunb/Iunb: 0.1% THD: 0.1% temperature: 0.1℃ 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:Main body-DI1 1:Main body-DI2 2:X1-DI1 3:X1-DI2 4:X1-DI3 5:X1-DI4 6:X2-DI1 7:X2-DI2 8:X2-DI3 9:X2-DI4 10:X3-DI1 11:X3-DI2 12:X3-DI3 13:X3-DI4	

			14:X4-DI1 15:X4-DI2 16:X4-DI3 17:X4-DI4	
081A	Int	Relay output Main body-DO1 hysteresis	The ratio is the same as above. Item is switch linkage: 0: When the digital input is closed, the relay output is closed, When the digital input is open, the relay output is open. 1: When the digital input is closed, the relay output is opened, When the digital input is opened, the relay output is closed.	R/W
081B	Int	Relay output Main body-DO1 Alarm delay time	0.00～99.99s	R/W
081C	Int	Relay output Main body-DO2 mode	0: OFF 1: alarm 2: remote control	R/W
081D	Int	Relay output Main body-DO2 Pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
081E	Int	Relay output Main body-DO2 Alarm item select	Alarm Item: 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:Vlnavg > 17:Vlnavg < 18:Vllavg > 19:Vllavg < 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: Present demand value -I1 >	
			51: Present demand value -I1 <	
			52: Present demand value –I2 >	
			53: Present demand value –I2 <	
			54: Present demand value –I3 >	
			55: Present demand	

			value –I3 < 56: Present demand value –I > 57: Present demand value –I < 58: Present demand value –P > 59: Present demand value –P < 60: Present demand value –Q > 61: Present demand value –Q < 62: Present demand value –S > 63: Present demand value –S < 64: X1-Pt100-1 > 65: X1-Pt100-1 < 66: X1-Pt100-2 > 67: X1-Pt100-2 < 68: X1-Pt100 > 69: X1-Pt100 < 70: X2-Pt100-1 > 71: X2-Pt100-1 < 72: X2-Pt100-2 > 73: X2-Pt100-2 < 74: X2-Pt100 > 75: X2-Pt100 <	

			76:X3-Pt100-1 > 77: X3-Pt100-1 < 78: X3-Pt100-2 > 79: X3-Pt100-2 < 80: X3-Pt100 > 81: X3-Pt100 < 82: X4-Pt100-1 > 83: X4-Pt100-1 < 84:X4-Pt100-2 > 85: X4-Pt100-2 < 86: X4-Pt100 > 87: X4-Pt100 < 88: DI，When the digital input is1,the relay closes.	
081F	Int	Relay output Main body–DO2 limit value	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A Power: 1W/var/VA PF: 0.001 F: 0.01Hz Uunb/Iunb: 0.1% THD: 0.1% temperature: 0.1℃ Uunb /Iunb /THDu /THDi: 0.01% Setting parameter value should be smaller than two times of rated value.	R/W

			If it is switch linkage, this value corresponds to the No. of digital input. 0:Main body-DI1 1:Main body-DI2 2:X1-DI1 3:X1-DI2 4:X1-DI3 5:X1-DI4 6:X2-DI1 7:X2-DI2 8:X2-DI3 9:X2-DI4 10:X3-DI1 11:X3-DI2 12:X3-DI3 13:X3-DI4 14:X4-DI1 15:X4-DI2 16:X4-DI3 17:X4-DI4	
0820	Int	Relay output Main body-DO2 hysteresis	The ratio is the same as above. Item is switch linkage: 0: When the digital input is closed, the relay output is closed, When the digital input is open, the relay output is open. 1: When the digital input is	R/W

			closed, the relay output is opened, When the digital input is opened, the relay output is closed.	
0821	Int	Relay output Main body-DO2 Alarm delay time	0.00～99.99s	R/W
0822-0824	----			
0825	Int	High byte: Main body DI1 mode	0:state monitor 1:pulse counter	R/W
		Low byte: Main body DI2 mode	0:state monitor 1:pulse counter	R/W
0826-082B	----			
082C	Int	Data recording interval (min)	1-1440min	R/W
082D	Int	Save data item	0: V1, 1: V2, 2: V3, 3: U12 4: U23, 5: U31, 6: I1 7: I2 8: I3, 9: I0 10: P1 11: P2 12: P3, 13: P,	R/W

			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: Vlnavg 28: Vllavg 29: Iavg 30: phase angle of voltage-V1 31: phase angle of voltage-V2-V1 32: phase angle of voltage-V3-V1 33: phase angle of current-I1 34: phase angle of current-I2-I1 35: phase angle of current-I3-I1 36:Positive-sequence component of voltage 37: Negative-sequence	

			component of voltage 38: Zero-sequence component of voltage 39: Unbalance factor of voltage 40: ---- 41: Positive-sequence component of current 42: Negative-sequence component of current 43: Zero-sequence component of current 44: Unbalance factor of current 45: ---- 46: THD-V1 47: THD-V2 48: THD-V3 49: THD-I1 50: THD-I2 51: THD-I3 52: Fundamental value -V1 53: Fundamental value -V2 54: Fundamental value -V3 55: Fundamental value -I1 56: Fundamental value -I2 57: Fundamental value -I3	
082E	Int	Channel 2	the same as above	R/W
082F	Int	Channel 3	the same as above	R/W

0830	Int	Channel 4	the same as above	R/W
0831	Int	Channel 5	the same as above	R/W
0832	Int	Channel 6	the same as above	R/W
0833	Int	X1-Slave address (FM8,FM11)	1-247	R/W
0834	Int	X1-Baudrate (FM11)	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps	R/W
0835	Int	X1-Parity（FM11）	0: N,8,1 1: E,8,1 2: O,8,1 3: N,8,2	R/W
0836	Int	----		
0837	Int	X2-Slave address (FM8,FM11)	1-247	R/W
0838	Int	X2-Baudrate (FM11)	0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps	R/W
0839	Int	X2-Parity（FM11）	0: N,8,1 1: E,8,1 2: O,8,1 3: N,8,2	R/W
083A	--	--	--	
083B-083C	Char	Mbus Identification	Char[4]	R/W
083D-083E	Char	Mbus Manufacturer	Char[4]	R/W

083F	Char	High byte： Mbus Version Low byte： Mbus Medium	Char[2]	R/W
0840	Char	High byte： Mbus Baud Rate Low byte： Mbus Primary Address	Char[2]	R/W
0841	Int	Lora channel		R/W
0842-0843	Long	Energy plus	Result=36960000/ energy pulse constant /Ct/Pt; It is recommended that Result should be within 2000-40000 and no more than 65536。If Result is less than 2000，it is recommended that the smaller the data after the decimal point, the better.	
0844	Int	Period 1 of #1 Day Tariff	00h: 00m(Fixed)	R/W
0845				
0846-084D	--	--	--	
086E	Int			R/W
086F	Int			
0870	Int	Voltage upper limit value	Secondary grid data: 0.1V	R/W
0871	Int	Voltage upper limit hysteresis value	Secondary grid data: 0.1V	R/W

0872	Int	Voltage low limit value	Secondary grid data: 0.1V	R/W
0873	Int	Voltage low limit hysteresis value	Secondary grid data: 0.1V	R/W
0874	Int	Current upper limit value	Secondary grid data: 0.001A	R/W
0875	Int	Current upper limit hysteresis value	Secondary grid data: 0.001A	R/W
0876	Int	Current low limit value	Secondary grid data: 0.001A	R/W
0877	Int	Current low limit hysteresis value	Secondary grid data: 0.001A	R/W
0878	Int	Active power upper limit value	Secondary grid data: 1W/var/VA	R/W
0879	Int	Active power upper limit hysteresis value	Secondary grid data: 1W/var/VA	R/W
087A	Int	Active power low limit value	Secondary grid data: 1W/var/VA	R/W
087B	Int	Active power low limit hysteresis value	Secondary grid data: 1W/var/VA	R/W
087C	In	Voltage qualification rate upper limit value	Secondary grid data: 0.1V	R/W
087D	In	Voltage qualification rate low limit value	Secondary grid data: 0.1V	R/W
087E	In	frequency qualification rate upper limit value	Secondary grid data: 0.01Hz	R/W
087F	In	Frequency qualification rate low	Secondary grid data: 0.01Hz	R/W

		limit value		
0880	Int	Voltage sag limit value	Secondary grid data: 0.1V	R/W
0881	Int	Voltage sag hysteresis value	Secondary grid data: 0.1V	R/W
0882	Int	Voltage swell limit value	Secondary grid data: 0.1V	R/W
0883	Int	Voltage swell hysteresis value	Secondary grid data: 0.1V	R/W
0884	Int	Voltage interruption Limit value	Secondary grid data: 0.1V	R/W
0885	Int	Voltage interruption hysteresis value	Secondary grid data: 0.1V	R/W
0886	Int	Over-voltage start value of fault wave record	Secondary grid data: 0.1V	R/W
0887	Int	Over-voltage hysteresis value of fault wave record	Secondary grid data: 0.1V	R/W
0888	Int	undervoltage start value of fault recorder	Secondary grid data: 0.1V	R/W
0889	Int	undervoltage hysteresis value of fault recorder	Secondary grid data: 0.1V	R/W
088A	Int	overcurrent start value of fault recorder	Secondary grid data: 0.001A	R/W
088B	Int	overcurrent hysteresis value of fault recorder	Secondary grid data: 0.001A	R/W
088C	Int	Voltage sag an	0: OFF, 1: ON	R/W

		Voltage swell enable		
088D	Int	fault recorder enable	0: OFF, 1: ON	R/W
088E-0895	----			
0896	Int	X1-AO1: Item	0: OFF 1:V1 2: V2 3: V3 4: U12 5: U21 6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3	R/W

			26: PF 27: F	
0897	Int	X1-AO1: Mode	0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
0898	Int	X1-AO1: Down scale	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A Power: 1W/var/VA PF: 0.001 F: 0.01Hz	R/W
0899	Int	X1-AO1: Full scale	the same as above	R/W
089A	Int	X1-AO2: Item	0: OFF 1:V1 2: V2 3: V3 4: U12 5: U21 6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3 14: P 15: Q1	R/W

			16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1 24: PF2 25: PF3 26: PF 27: F	
089B	Int	X1-AO2: Mode	0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
089C	Int	X1-AO2: Down scale	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A Power: 1W/var/VA PF: 0.001 F: 0.01Hz	R/W
089D	Int	X1-AO2: Full scale	the same as above	R/W
089E	Int	X2-AO1: Item	0: OFF 1:V1 2: V2 3: V3 4: U12 5: U21	R/W

			6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3 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	
089F	Int	X2-AO1: Mode	0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
08A0	Int	X2-AO1: Down scale	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A	R/W

			Power: 1W/var/VA PF: 0.001 F: 0.01Hz	
08A1	Int	X2-AO1: Full scale	the same as above	R/W
08A2	Int	X2-AO2: Item	0: OFF 1:V1 2: V2 3: V3 4: U12 5: U21 6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3 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	
08A3	Int	X2-AO2: Mode	0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
08A4	Int	X2-AO2: Down scale	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A Power: 1W/var/VA PF: 0.001 F: 0.01Hz	R/W
08A5	Int	X2-AO2: Full scale	the same as above	R/W
08A6	Int	X3-AO1: Item	0: OFF 1:V1 2: V2 3: V3 4: U12 5: U21 6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3 14: P	R/W

			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	
08A7	Int	X3-AO1: Mode	0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
08A8	Int	X3-AO1: Down scale	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A, Power: 1W/var/VA, PF: 0.001 F: 0.01Hz	R/W
08A9	Int	X3-AO1: Full scale	the same as above	R/W
08AA	Int	X3-AO2: Item	0: OFF 1:V1 2: V2 3: V3 4: U12	R/W

			5: U21 6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3 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	
08AB	Int	X3-AO2: Mode	0: 4～20 mA, 1: 0～20 mA, 2: 4～12～20 mA	R/W
08AC	Int	X3-AO2: Down scale	Secondary grid data, ratio: Voltage: 0.1V,	R/W

			Current: 0.001A, Power: 1W/var/VA, PF: 0.001, F: 0.01Hz	
08AD	Int	X3-AO2: Full scale	the same as above	R/W
08AE	Int	X4-AO1: Item	0: OFF 1:V1 2: V2 3: V3 4: U12 5: U21 6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3 14: P 15: Q1 16: Q2 17: Q3 18: Q 19: S1 20: S2 21: S3 22: S 23: PF1	R/W

			24: PF2 25: PF3 26: PF 27: F	
08AF	Int	X4-AO1: Mode	0: 4～20 mA, 1: 0～20 mA, 2: 4～12～20 mA	R/W
08B0	Int	X4-AO1: Down scale	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A, Power: 1W/var/VA, PF: 0.001, F: 0.01Hz	R/W
08B1	Int	X4-AO1: Full scale	the same as above	R/W
08B2	Int	X4-AO2: Item	0: OFF 1:V1 2: V2 3: V3 4: U12 5: U21 6: U32 7: I1 8: I2 9: I3 10: In 11: P1 12: P2 13: P3	R/W

			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	
08B3	Int	X4-AO2: Mode	0: 4～20 mA 1: 0～20 mA 2: 4～12～20 mA	R/W
08B4	Int	X4-AO2: Down scale	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A Power: 1W/var/VA PF: 0.001 F: 0.01Hz	R/W
08B5	Int	X4-AO2: Full scale	the same as above	R/W
08B6	Int	High byte: X1-DI1: Mode Low byte: X1-DI2: Mode	0: state monitor 1: pulse counter	R/W

08B7	Int	High byte: X1-DI3: Mode Low byte: X1-DI4: Mode	0: state monitor 1: pulse counter	R/W
08B8	Int	High byte: X2-DI1: Mode Low byte: X2-DI2: Mode	0: state monitor 1: pulse counter	R/W
08B9	Int	High byte: X2-DI3: Mode Low byte: X2-DI4: Mode	0: state monitor 1: pulse counter	R/W
08BA	Int	High byte: X3-DI1: Mode Low byte: X3-DI2: Mode	0: state monitor 1: pulse counter	R/W
08BB	Int	High byte: X3-DI3: Mode Low byte: X3-DI4: Mode	0: state monitor 1: pulse counter	R/W
08BC	Int	High byte: X4-DI1: Mode Low byte: X4-DI2: Mode	0: state monitor 1: pulse counter	R/W
08BD	Int	High byte: X4-DI3: Mode Low byte: X4-DI4: Mode	0: state monitor 1: pulse counter	R/W
08BE-08C1	----			

08C2	Int	Relay output X1-DO1 mode	0: OFF 1: alarm 2: remote control	R/W
08C3	Int	Relay output X1-DO1 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08C4	Int	Relay output X1-DO1 alarm select	Alarm Item: 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:Vlnavg > 17:Vlnavg < 18:Vllavg > 19:Vllavg < 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: Present demand value -I1 >>	

			51: Present demand value -I1 < 52: Present demand value –I2 > 53: Present demand value –I2 < 54: Present demand value –I3 > 55: Present demand value –I3 < 56: Present demand value –I > 57: Present demand value –I < 58: Present demand value –P > 59: Present demand value –P < 60: Present demand value –Q > 61: Present demand value –Q < 62: Present demand value –S > 63: Present demand value –S < 64: X1-Pt100-1 > 65: X1-Pt100-1 < 66: X1-Pt100-2 >	

			67: X1-Pt100-2 < 68: X1-Pt100 > 69: X1-Pt100 < 70: X2-Pt100-1 > 71: X2-Pt100-1 < 72: X2-Pt100-2 > 73: X2-Pt100-2 < 74: X2-Pt100 > 75: X2-Pt100 < 76:X3-Pt100-1 > 77: X3-Pt100-1 < 78: X3-Pt100-2 > 79: X3-Pt100-2 < 80: X3-Pt100 > 81: X3-Pt100 < 82: X4-Pt100-1 > 83: X4-Pt100-1 < 84:X4-Pt100-2 > 85: X4-Pt100-2 < 86: X4-Pt100 > 87: X4-Pt100 < 88: DI，When the digital input is1,the relay closes.	
08C5	Int	Relay output X1-DO1 limit value	Secondary grid data, ratio: Voltage: 0.1V, Current: 0.001A Power: 1W/var/VA PF: 0.001	R/W

			F: 0.01Hz Uunb/Iunb: 0.1% THD: 0.1% temperature: 0.1℃ 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:Main body-DI1 1:Main body-DI2 2:X1-DI1 3:X1-DI2 4:X1-DI3 5:X1-DI4 6:X2-DI1 7:X2-DI2 8:X2-DI3 9:X2-DI4 10:X3-DI1 11:X3-DI2 12:X3-DI3 13:X3-DI4 14:X4-DI1 15:X4-DI2 16:X4-DI3	

			17:X4-DI4	
08C6	Int	Relay output X1-DO1 hysteresis	The ratio is the same as above. Item is switch linkage: 0: When the digital input is closed, the relay output is closed, When the digital input is open, the relay output is open. 1: When the digital input is closed, the relay output is opened, When the digital input is opened, the relay output is closed.	R/W
08C7	Int	Relay output X1-DO1 Alarm delay time	0.00～99.99s	R/W
08C8	Int	Relay output X1-DO2 mode	0: OFF 1: alarm 2: remote control	R/W
08C9	Int	Relay output X1-DO2 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08CA	Int	Relay output X1-DO2 alarm select	Alarm Item: The same as X1-DO1	R/W
08CB	Int	Relay output X1-DO2 limit value	Secondary grid data, The same as X1-DO1	R/W
08CC	Int	Relay output X1-DO2 hysteresis	The ratio is the same as X1-DO1.	R/W
08CD	Int	Relay output X1-DO2 Alarm delay time	0.00～99.99s	R/W

08CE	Int	Relay output X2-DO1 mode	0: OFF 1: alarm 2: remote control	R/W
08CF	Int	Relay output X2-DO1 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08D0	Int	Relay output X2-DO1 alarm select	Alarm Item: The same as X1-DO1	R/W
08D1	Int	Relay output X2-DO1 limit value	Secondary grid data, The same as X1-DO1	R/W
08D2	Int	Relay output X2-DO1 hysteresis	The ratio is the same as X1-DO1.	R/W
08D3	Int	Relay output X2-DO1 Alarm delay time	0.00～99.99s	R/W
08D4	Int	Relay output X2-DO2 mode	0: OFF 1: alarm 2: remote control	R/W
08D5	Int	Relay output X2-DO2 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08D6	Int	Relay output X2-DO2 alarm select	Alarm Item: The same as X1-DO1	R/W
08D7	Int	Relay output X2-DO2 limit value	Secondary grid data, The same as X1-DO1	R/W
08D8	Int	Relay output X2-DO2 hysteresis	The ratio is the same as X1-DO1	R/W
08D9	Int	Relay output X2-DO2 Alarm delay time	0.00～99.99s	R/W
08DA	Int	Relay output	0: OFF	R/W

		X3-DO1 mode	1: alarm 2: remote control	
08DB	Int	Relay output X3-DO1 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08DC	Int	Relay output X3-DO1 alarm select	Alarm Item: The same as X1-DO1	R/W
08DD	Int	Relay output X3-DO1 limit value	Secondary grid data, The same as X1-DO1	R/W
08DE	Int	Relay output X3-DO1 hysteresis	The ratio is the same as X1-DO1	R/W
08DF	Int	Relay output X3-DO1 Alarm delay time	0.00～99.99s	R/W
08E0	Int	Relay output X3-DO2 mode	0: OFF 1: alarm 2: remote control	R/W
08E1	Int	Relay output X3-DO2 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08E2	Int	Relay output X3-DO2 alarm select	Alarm Item: The same as X1-DO1	R/W
08E3	Int	Relay output X3-DO2 limit value	Secondary grid data, The same as X1-DO1	R/W
08E4	Int	Relay output X3-DO2 hysteresis	The ratio is the same as above. Item is switch linkage: 0: When the digital input is closed, the relay output is closed, When the digital input is open, the relay	R/W

			output is open. 1: When the digital input is closed, the relay output is opened, When the digital input is opened, the relay output is closed.	
08E5	Int	Relay output X3-DO2 Alarm delay time	0.00～99.99s	R/W
08E6	Int	Relay output X4-DO1 mode	0: OFF 1: alarm 2: remote control	R/W
08E7	Int	Relay output X4-DO1 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08E8	Int	Relay output X4-DO1 alarm select	Alarm Item: The same as X1-DO1	R/W
08E9	Int	Relay output X4-DO1 limit value	Secondary grid data, The same as X1-DO1	R/W
08EA	Int	Relay output X4-DO1 hysteresis	The ratio is the same as above. Item is switch linkage: 0: When the digital input is closed, the relay output is closed, When the digital input is open, the relay output is open. 1: When the digital input is closed, the relay output is opened, When the digital input is opened, the relay output is closed.	R/W

08EB	Int	Relay output X4-DO1 Alarm delay time	0.00～99.99s	R/W
08EC	Int	Relay output X4-DO2 mode	0: OFF 1: alarm 2: remote control	R/W
08ED	Int	Relay output X4-DO2 pulse width	0.0: no pulse pulse width : 0.1～99.99s	R/W
08EE	Int	Relay output X4-DO2 alarm select	Alarm Item: The same as X1-DO1	R/W
08EF	Int	Relay output X4-DO2 limit value	Secondary grid data, The same as X1-DO1	R/W
08F0	Int	Relay output X4-DO2 hysteresis	The ratio is the same as X1-DO1	R/W
08F1	Int	Relay output X4-DO2 Alarm delay time	0.00～99.99s	R/W
08F2-0913	----			R/W
0914	Int	DNP3.0 Set	Addr	R/W
0915	--		--	--
0916	Int		Port number	R/W
0917-091E	RJ45: char[4][]		Char[4][4] [0][4] Local IP [1][4] Remote IP [2][4] subnet mask [3][4] gateway address	R/W
091F-0921	RJ45: char[6]		MAC Address	R
0922-0923	Char	BACNet Module Set	BACnet ID：Char[4] 0 ~ 0x3FFFFF（22bit）	R/W

0924	Char		BACnet/MSTP baud： 0：1200bps， 1：2400bps 2：4800bps， 3：9600bps 4：19200bps	R/W
			BACnet/MSTP address：0-127	R/W
0925	Char		High byte：BACnet/MSTP Maximum number of primary nodes，0-127； Low byte：--	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 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 Port number	R/W R/W
0934	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	
0935-0954	Int		MAC Address: Char[6]	R/W
0955-0957	Int		High byte: WIFI Mode 1: Station（default） 2: Soft AP 3: Station + Soft AP Low byte: Encryption 0: WEP; 1: WPA/WPA2 Psk; 2: NONE	R
0958	Int		WIFI Network Name: Char[32]	R/W
0959-0968	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
0969	Int		Char[16]: WEP password	R/W
096A-0971	Int		Char[32]: WAP/WAP2 password	R/W
0972-0981	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
0982-0987	Int		High byte: DHCP 0: invalid 1: dynamic allocation ip address Low byte: Connect Mode	R/W

			0:Server; 1: Client	
0988	Int	GPRS Module Set	High byte: DHCP 0: invalid 1: dynamic allocation ip address Low byte: Connect Mode 0:Server; 1: Client	R/W
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-0A0F	----			
0A10	Int	User-defined data type 1 (The corresponding address starts at 0x1000)	The following data 1 to 101 are floating-point data, the specific data format, please refer to the floating-point data types. 0: ---- 1: Ua, 2: UB, 3: Uc, 4: Uab 5: Ubc, 6: Uca, 7: Ia, 8: Ib, 9: Ic, 10: In, 11: Pa, 12: Pb, 13: Pc, 14: P, 15: Qa,	

			16: Qb, 17: Qc, 18: Q, 19: Sa, 20: Sb, 21: Sc, 22: S, 23: Pfa, 24: PFb, 25: PFc, 26: PF, 27: F, 28: Import Active Energy, 29: Export Active Energy, 30: Import Reactive Energy, 31: Export Reactive Energy, 32: Apparent Energy, 33: 1st Quadrant Reactive Energy - EQL+, 34: 2nd Quadrant Reactive Energy - EQC+, 35: 3rd Quadrant Reactive Energy - EQL-, 36: 4th Quadrant Reactive Energy - EQC-, 37: Fundamental Import Active Energy, 38: Fundamental Export Active Energy,	

			39: Fundamental Import Reactive Energy, 40: Fundamental Export Reactive Energy, 41: L1 Import Active Energy, 42: L2 Import Active Energy, 43: L3 Import Active Energy, 44: L1 Export Active Energy, 45: L2 Export Active Energy, 46: L3 Export Active Energy, 47: L1 Import Reactive Energy, 48: L2 Import Reactive Energy, 49: L3 Import Reactive Energy, 50: L1 Export Reactive Energy, 51: L2 Export Reactive Energy, 52: L3 Export Reactive Energy, 53: Total tariff import energy, 54: Tariff T1 import energy, 55: Tariff T2 import energy, 56: Tariff T3 import energy, 57: Tariff T4 import energy, 58: Present month Total tariff import energy, 59: Present month Tariff T1 import energy, 60: Present month Tariff T2 import energy, 61: Present month Tariff T3 import energy,	

			62: Present month Tariff T4 import energy, 63: Present demand value -I1, 64: Present demand value –I2, 65: Present demand value –I3, 66: Present demand value –P, 67: Present demand value -Q, 68: Present demand value -S 69: Previous demand value -I1, 70: Previous demand value –I2, 71: Previous demand value –I3, 72: Previous demand value –P, 73: Previous demand value –Q, 74: Previous demand value –S, 75: Max. demand value -I1, 76: Max. demand value –I2, 77: Max. demand value –I3, 78: Max. demand value –P, 79: Max. demand value –Q, 80: Max. demand value –S, 81: Positive-sequence component of voltage, 82: Negative-sequence component of voltage, 83: Zero-sequence component of voltage, 84: Unbalance factor of voltage, 85: Positive-sequence component of current,	

			86: Negative-sequence component of current, 87: Zero-sequence component of current, 88: Unbalance factor of current 89: Average value of Vph-n, 90: Average value of Vph-ph, 91: Average current, 92: Average P, 93: Average Q, 94: Average S, 95: Deviation-V1, 96: Deviation-V2, 97: Deviation-V3, 98: Deviation-V12, 99: Deviation-V23, 100: Deviation-V31, 101: Deviation-F, The following data 102 to 110 are integer data, the specific data format, please refer to the integer data types. 102: Phase angle of V1, Phase angle of V2, 103: Phase angle of V3, Phase angle of I1, 104: Phase angle of I2, Phase angle of I3, 105: Crest factor V1,	

			Crest factor V2, 106: Crest factor V3, K-factor I1, 107: K-factor I2, K-factor I3, 108: THD-V1,THD-V2, 109: THD-V3,THD-I1, 110: THD-I2,THD-I3,	
0A11	Int	User-defined data type 2	The same as above	R/W
0A12	Int	User-defined data type 3	The same as above	R/W
0A13	Int	User-defined data type 4	The same as above	R/W
0A14	Int	User-defined data type 5	The same as above	R/W
0A15	Int	User-defined data type 6	The same as above	R/W
0A16	Int	User-defined data type 7	The same as above	R/W
0A17	Int	User-defined data type 8	The same as above	R/W
0A18	Int	User-defined data type 9	The same as above	R/W
0A19	Int	User-defined data type 10	The same as above	R/W
0A1A	Int	User-defined data type 11	The same as above	R/W
0A1B	Int	User-defined data	The same as above	R/W

		type 12		
0A1C	Int	User-defined data type 13	The same as above	R/W
0A1D	Int	User-defined data type 14	The same as above	R/W
0A1E	Int	User-defined data type 15	The same as above	R/W
0A1F	Int	User-defined data type 16	The same as above	R/W
0A20	Int	User-defined data type 17	The same as above	R/W
0A21	Int	User-defined data type 18	The same as above	R/W
0A22	Int	User-defined data type 19	The same as above	R/W
0A23	Int	User-defined data type 20	The same as above	R/W
0A24	Int	User-defined data type 21	The same as above	R/W
0A25	Int	User-defined data type 22	The same as above	R/W
0A26	Int	User-defined data type 23	The same as above	R/W
0A27	Int	User-defined data type 24	The same as above	R/W
0A28	Int	User-defined data type 25	The same as above	R/W
0A29	Int	User-defined data type 26	The same as above	R/W

0A2A	Int	User-defined data type 27	The same as above	R/W
0A2B	Int	User-defined data type 28	The same as above	R/W
0A2C	Int	User-defined data type 29	The same as above	R/W
0A2D	Int	User-defined data type 30	The same as above	R/W
0A2E	Int	User-defined data type 31	The same as above	R/W
0A2F	Int	User-defined data type 32	The same as above	R/W
0A30	Int	User-defined data type 33	The same as above	R/W
0A31	Int	User-defined data type 34	The same as above	R/W
0A32	Int	User-defined data type 35	The same as above	R/W
0A33	Int	User-defined data type 36	The same as above	R/W
0A34	Int	User-defined data type 37	The same as above	R/W
0A35	Int	User-defined data type 38	The same as above	R/W
0A36	Int	User-defined data type 39	The same as above	R/W
0A37	Int	User-defined data type 40	The same as above	R/W
0A38	Int	User-defined data	The same as above	R/W

		type 41		
0A39	Int	User-defined data type 42	The same as above	R/W
0A3A	Int	User-defined data type 43	The same as above	R/W
0A3B	Int	User-defined data type 44	The same as above	R/W
0A3C	Int	User-defined data type 45	The same as above	R/W
0A3D	Int	User-defined data type 46	The same as above	R/W
0A3E	Int	User-defined data type 47	The same as above	R/W
0A3F	Int	User-defined data type 48	The same as above	R/W
0A40	Int	User-defined data type 49	The same as above	R/W
0A41	Int	User-defined data type 50	The same as above	R/W
0A42	Int	User-defined data type 51	The same as above	R/W
0A43	Int	User-defined data type 52	The same as above	R/W
0A44	Int	User-defined data type 53	The same as above	R/W
0A45	Int	User-defined data type 54	The same as above	R/W
0A46	Int	User-defined data type 55	The same as above	R/W

0A47	Int	User-defined data type 56	The same as above	R/W
0A48	Int	User-defined data type 57	The same as above	R/W
0A49	Int	User-defined data type 58	The same as above	R/W
0A4A	Int	User-defined data type 59	The same as above	R/W
0A4B	Int	User-defined data type 60	The same as above	R/W
0A4C-0AFF	----			

3.10 User-defined data

Address	Format	Description	Unit	R/W
1000-1001	Float / Int	User-defined data 1 (The data type is referenced at adresss 0xA010.)	The unit of data is determined by the data type.	R
1002-1003	Float / Int	User-defined data 2 (0xA011)	The same as above	R
1004-1005	Float / Int	User-defined data 3 (0xA012)	The same as above	R
1006-1007	Float / Int	User-defined data 4 (0xA013)	The same as above	R
1008-1009	Float / Int	User-defined data 5 (0xA014)	The same as above	R
100A-100B	Float / Int	User-defined data 6 (0xA015)	The same as above	R

100C-100D	Float / Int	User-defined data 7 (0xA016)	The same as above	R
100E-100F	Float / Int	User-defined data 8 (0xA017)	The same as above	R
1010-1011	Float / Int	User-defined data 9 (0xA018)	The same as above	R
1012-1013	Float / Int	User-defined data 10 (0xA019)	The same as above	R
0014-1015	Float / Int	User-defined data 11 (0xA01A)	The same as above	R
1016-1017	Float / Int	User-defined data 12 (0xA01B)	The same as above	R
1018-1019	Float / Int	User-defined data 13 (0xA01C)	The same as above	R
101A-101B	Float / Int	User-defined data 14 (0xA01D)	The same as above	R
101C-101D	Float / Int	User-defined data 15 (0xA01E)	The same as above	R
101E-101F	Float / Int	User-defined data 16 (0xA01F)	The same as above	R
1020-1021	Float / Int	User-defined data 17 (0xA020)	The same as above	R
1022-1023	Float / Int	User-defined data 18 (0xA021)	The same as above	R
1024-1025	Float / Int	User-defined data 19 (0xA022)	The same as above	R
1026-1027	Float / Int	User-defined data 20 (0xA023)	The same as above	R
1028-1029	Float / Int	User-defined data 21	The same as above	R

		(0xA024)		
102A-102B	Float / Int	User-defined data 22 (0xA025)	The same as above	R
102C-102D	Float / Int	User-defined data 23 (0xA026)	The same as above	R
102E-102F	Float / Int	User-defined data 24 (0xA027)	The same as above	R
1030-1031	Float / Int	User-defined data 25 (0xA028)	The same as above	R
1032-1033	Float / Int	User-defined data 26 (0xA029)	The same as above	R
1034-1035	Float / Int	User-defined data 27 (0xA02A)	The same as above	R
1036-1037	Float / Int	User-defined data 28 (0xA02B)	The same as above	R
1038-1039	Float / Int	User-defined data 29 (0xA02C)	The same as above	R
103A-103B	Float / Int	User-defined data 30 (0xA02D)	The same as above	R
103C-103D	Float / Int	User-defined data 31 (0xA02E)	The same as above	R
103E-103F	Float / Int	User-defined data 32 (0xA02F)	The same as above	R
1040-1041	Float / Int	User-defined data 33 (0xA030)	The same as above	R
1042-1043	Float / Int	User-defined data 34 (0xA031)	The same as above	R
1044-1045	Float / Int	User-defined data 35 (0xA032)	The same as above	R

1046-1047	Float / Int	User-defined data 36 (0xA033)	The same as above	R
1048-1049	Float / Int	User-defined data 37 (0xA034)	The same as above	R
104A-104B	Float / Int	User-defined data 38 (0xA035)	The same as above	R
104C-104D	Float / Int	User-defined data 39 (0xA036)	The same as above	R
104E-104F	Float / Int	User-defined data 40 (0xA037)	The same as above	R
1050-1051	Float / Int	User-defined data 41 (0xA038)	The same as above	R
1052-1053	Float / Int	User-defined data 42 (0xA039)	The same as above	R
1054-1055	Float / Int	User-defined data 43 (0xA03A)	The same as above	R
1056-1057	Float / Int	User-defined data 44 (0xA03B)	The same as above	R
1058-1059	Float / Int	User-defined data 45 (0xA03C)	The same as above	R
105A-105B	Float / Int	User-defined data 46 (0xA03D)	The same as above	R
105C-105D	Float / Int	User-defined data 47 (0xA03E)	The same as above	R
105E-105F	Float / Int	User-defined data 48 (0xA03F)	The same as above	R
1060-1061	Float / Int	User-defined data 49 (0xA040)	The same as above	R
1062-1063	Float / Int	User-defined data 50	The same as above	R

		(0xA041)		
1064-1065	Float / Int	User-defined data 51 (0xA042)	The same as above	R
1066-1067	Float / Int	User-defined data 52 (0xA043)	The same as above	R
1068-1069	Float / Int	User-defined data 53 (0xA044)	The same as above	R
106A-106B	Float / Int	User-defined data 54 (0xA045)	The same as above	R
106C-106D	Float / Int	User-defined data 55 (0xA046)	The same as above	R
106E-106F	Float / Int	User-defined data 56 (0xA047)	The same as above	R
1070-1071	Float / Int	User-defined data 57 (0xA048)	The same as above	R
1072-1073	Float / Int	User-defined data 58 (0xA049)	The same as above	R
1074-1075	Float / Int	User-defined data 59 (0xA04A)	The same as above	R
1076-1077	Float / Int	User-defined data 60 (0xA04B)	The same as above	R

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