

Measuring class parameter [Integer format data]

Holding Register Parameter [Read : Function code : 03H]				Register Address [Hex]	
Description	Length (bytes)	Data Format	Units	High Byte	Low Byte
Phase 1 line to neutral volts.	4	ULONG	0.01V	00	00
Phase 2 line to neutral volts.	4	ULONG	0.01V	00	02
Phase 3 line to neutral volts.	4	ULONG	0.01V	00	04
Phase 1 current.	4	ULONG	0.001A	00	06
Phase 2 current.	4	ULONG	0.001A	00	08
Phase 3 current.	4	ULONG	0.001A	00	0A
Phase 1 active power.	4	LONG	0.001kW	00	0C
Phase 2 active power.	4	LONG	0.001kW	00	0E
Phase 3 active power.	4	LONG	0.001kW	00	10
Phase 1 reactive power.	4	LONG	0.001kvar	00	12
Phase 2 reactive power.	4	LONG	0.001kvar	00	14
Phase 3 reactive power.	4	LONG	0.001kvar	00	16
Phase 1 apparent power.	4	ULONG	0.001kVA	00	18
Phase 2 apparent power.	4	ULONG	0.001kVA	00	1A
Phase 3 apparent power.	4	ULONG	0.001kVA	00	1C
Phase 1 power factor (1).	2	INT	0.001	00	1E
Phase 2 power factor (1).	2	INT	0.001	00	1F
Phase 3 power factor (1).	2	INT	0.001	00	20
Phase 1 phase angle.	2	INT	0.01°	00	21
Phase 2 phase angle.	2	INT	0.01°	00	22
Phase 3 phase angle.	2	INT	0.01°	00	23
Line 1 to Line 2 volts.	4	ULONG	0.01V	00	24
Line 2 to Line 3 volts.	4	ULONG	0.01V	00	26
Line 3 to Line 1 volts.	4	ULONG	0.01V	00	28
Frequency of supply voltages.	2	UINT	0.01Hz	00	2A
Total system active power.	4	LONG	0.001kW	00	2C
Total system reactive power.	4	LONG	0.001kvar	00	2E
Total system apparent power.	4	LONG	0.001kVA	00	30
Total system power factor (1).	2	INT	0.001	00	32
Total system phase angle.	2	INT	0.01°	00	33
Sum of line currents.	4	ULONG	0.001A	00	34
Average line to neutral volts.	4	ULONG	0.01V	00	36
Average line to line volts.	4	ULONG	0.01V	00	38
Average line current.	4	ULONG	0.001A	00	3A
Neutral current.	4	ULONG	0.001A	00	3C
Total system active power demand (3).	4	LONG	0.001kW	00	66
Total system reactive power demand (3).	4	LONG	0.001kvar	00	68
Total system apparent power demand.	4	LONG	0.001kVA	00	6A
Phase 1 current demand.	4	ULONG	0.001A	00	6C
Phase 2 current demand.	4	ULONG	0.001A	00	6E

Phase 3 current demand.	4	ULONG	0.001A	00	70
Maximum total system active power demand (3).	4	LONG	0.001kW	00	7C
Maximum total system reactive power demand (3).	4	LONG	0.001kvar	00	7E
Maximum total system apparent power demand.	4	ULONG	0.001kVA	00	80
Maximum phase 1 current demand.	4	ULONG	0.001A	00	82
Maximum phase 2 current demand.	4	ULONG	0.001A	00	84
Maximum phase 3 current demand.	4	ULONG	0.001A	00	86
Total import active energy.	4	ULONG	0.01kWh	04	00
Total export active energy.	4	ULONG	0.01kWh	04	02
Total active Energy.	4	ULONG	0.01kWh	04	04
Total import reactive energy.	4	ULONG	0.01kvarh	04	08
Total export reactive energy.	4	ULONG	0.01kvarh	04	0A
Total reactive Energy.	4	ULONG	0.01kvarh	04	0C
Total active energy of rate 1	4	ULONG	0.01kWh	04	38
Total active energy of rate 2	4	ULONG	0.01kWh	04	3A
Total active energy of rate 3	4	ULONG	0.01kWh	04	3C
Total active energy of rate 4	4	ULONG	0.01kWh	04	3E
Import active energy of rate 1	4	ULONG	0.01kWh	04	40
Import active energy of rate 2	4	ULONG	0.01kWh	04	42
Import active energy of rate 3	4	ULONG	0.01kWh	04	44
Import active energy of rate 4	4	ULONG	0.01kWh	04	46
Export active energy of rate 1	4	ULONG	0.01kWh	04	48
Export active energy of rate 2	4	ULONG	0.01kWh	04	4A
Export active energy of rate 3	4	ULONG	0.01kWh	04	4C
Export active energy of rate 4	4	ULONG	0.01kWh	04	4E
Total reactive energy of rate 1	4	ULONG	0.01kvarh	04	50
Total reactive energy of rate 2	4	ULONG	0.01kvarh	04	52
Total reactive energy of rate 3	4	ULONG	0.01kvarh	04	54
Total reactive energy of rate 4	4	ULONG	0.01kvarh	04	56
Import reactive energy of rate 1	4	ULONG	0.01kvarh	04	58
Import reactive energy of rate 2	4	ULONG	0.01kvarh	04	5A
Import reactive energy of rate 3	4	ULONG	0.01kvarh	04	5C
Import reactive energy of rate 4	4	ULONG	0.01kvarh	04	5E
Export reactive energy of rate 1	4	ULONG	0.01kvarh	04	60
Export reactive energy of rate 2	4	ULONG	0.01kvarh	04	62
Export reactive energy of rate 3	4	ULONG	0.01kvarh	04	64
Export reactive energy of rate 4	4	ULONG	0.01kvarh	04	66
Monthly energy consumption for the last 12 months					
Total active energy category (Each set of data includes the energy of all rate segments, the energy of rate 1, the energy of rate 2, the energy of rate 3 and the energy of rate 4 respectively)					
The total active energy consumption of the current months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	0C
The total active energy consumption of the last 1 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	16

The total active energy consumption of the last 2 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	20
The total active energy consumption of the last 3 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	2A
The total active energy consumption of the last 4 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	34
The total active energy consumption of the last 5 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	3E
The total active energy consumption of the last 6 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	48
The total active energy consumption of the last 7 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	52
The total active energy consumption of the last 8 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	5C
The total active energy consumption of the last 9 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	66
The total active energy consumption of the last 10 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	70
The total active energy consumption of the last 11 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	7A
The total active energy consumption of the last 12 months (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	09	84
Daily energy consumption for the last 31 days					
Total active energy category (Each set of data includes the energy of all rate segments, the energy of rate 1, the energy of rate 2, the energy of rate 3 and the energy of rate 4 respectively)					
The total active energy consumption of the current days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	18
The total active energy consumption of the last 1 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	22
The total active energy consumption of the last 2 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	2C
The total active energy consumption of the last 3 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	36
The total active energy consumption of the last 4 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	40
The total active energy consumption of the last 5 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	4A
The total active energy consumption of the last 6 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	54
The total active energy consumption of the last 7 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	5E
The total active energy consumption of the last 8 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	68
The total active energy consumption of the last 9 days	20	ULONG	0.01kWh	0C	72

(Total、Rate1、Rate2、Rate3、Rate4)					
The total active energy consumption of the last 10 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	7C
The total active energy consumption of the last 11 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	86
The total active energy consumption of the last 12 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	90
The total active energy consumption of the last 13 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	9A
The total active energy consumption of the last 14 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	A4
The total active energy consumption of the last 15 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	AE
The total active energy consumption of the last 16 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	B8
The total active energy consumption of the last 17 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	C2
The total active energy consumption of the last 18 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	CC
The total active energy consumption of the last 19 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	D6
The total active energy consumption of the last 20 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	E0
The total active energy consumption of the last 21 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	EA
The total active energy consumption of the last 22 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	F4
The total active energy consumption of the last 23 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0C	FE
The total active energy consumption of the last 24 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	08
The total active energy consumption of the last 25 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	12
The total active energy consumption of the last 26 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	1C
The total active energy consumption of the last 27 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	26
The total active energy consumption of the last 28 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	30
The total active energy consumption of the last 29 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	3A
The total active energy consumption of the last 30 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	44
The total active energy consumption of the last 31 days (Total、Rate1、Rate2、Rate3、Rate4)	20	ULONG	0.01kWh	0D	4E

Notes:

1. The power factor has its sign adjusted to indicate the direction of the current. Positive refers to forward current, negative refers to reverse current.
2. The power sum demand calculation is for import – export.

Set class parameters

Holding Register Parameter [Read : Function code : 03H ; Write : Function code : 10H]				Register Address [Hex]		
Parameter	Description	Length (bytes)	Data Format	High Byte	Low Byte	Mode
Key Parameter Programming Authorization (KPPA)	Read: to get the status of the KPPA 0 = not authorized; 1 = authorized Write the correct password to get KPPA, enable to program key parameters.	2	UINT	50	00	R/W
Demand Period	Write demand period: 0~60 minutes, Default 60. Range: 0~60, 0 means function update every second.	2	UINT	50	02	R/W
Slide time	Default 1, min. Range: 1 ~ (Demand Period -1).	2	UINT	50	03	R/W
Modbus address	Write the modbus address Range: 1 to 247 for MODBUS Protocol, default 1.	2	UINT	50	05	R/W
Network Baud Rate	Write the network port baud rate for MODBUS Protocol, where: 0 = 1200 baud. 1 = 2400 baud. 2 = 4800 baud. 3 = 9600 baud, default.	2	UINT	50	06	R/W
Parity and stop bit	Write the network port parity/stop bits for MODBUS Protocol, where: 0 = One stop bit and no parity, default. 1 = One stop bit and even parity. 2 = One stop bit and odd parity. 3 = Two stop bits and no parity.	2	UINT	50	07	R/W
Password	Read: to get the password of the meter Write: to program the new password of the meter Default : 0000 (KPPA is asked)	2	UINT	50	08	R/W
Pulse 1 Energy Type	Write MODBUS Protocol input parameter for pulse output 1: 1: import active energy 2: total active energy 4: export active energy, default 5: import reactive energy 6: total reactive energy 8: export reactive energy	2	UINT	50	09	R/W

Pulse 1 constant	Write pulse constant index: n = 0 to 3 0 : 1000 imp/kWh(kvarh), default 1 : 100 imp/kWh(kvarh) 2 : 10 imp/kWh(kvarh) 3 : 1 imp/kWh(kvarh) Note: When the pulse constant is set to 1000 imp, the pulse output width is automatically modify to 35ms.	2	UINT	50	0A	R/W
Pulse 1 Width	Write pulse on period in milliseconds: 60, 100 or 200, default 100. Note: When the pulse constant is set to 1000 imp, the pulse output width is automatically modify to 35ms, which cannot be setting.	2	UINT	50	0B	R/W
Automatic Scroll Display Time	Automatic scroll display time, unit : second Range 0~60, default : 0 Note: 0 mean stop automatic scroll display	2	UINT	50	18	R/W
Backlit time	Backlit time, unit : minute. Default 60. Range 0~120 or 255, 0 means backlit always on, 255 means backlit always off.	2	UINT	50	19	R/W
System time	Data definition: 20-Year-Month-Date-Week-Hour-Minute-Second	8	BCD	50	1A	R/W
Tariff	Data definition: Tariff number-Min-Hour Tariff number: 00, 01, 02, 03, 04; 00 mean invalid tariff number Min: 00-59 Hour: 00-23	24	BCD	50	1E	R/W
Alarm object(1)	Range: 0~31, and 255; Default: 255 = null	2	UINT	51	80	R/W
Alarm action delay time	Alarm action delay time, unit: ms Range:0~9999; default: 0 ms Note: When an alarm event occurs, the alarm action will be performed only after the delay time. If the delay time is set to 0, the alarm action will be executed immediately.	2	UINT	51	81	R/W
Alarm threshold (2)	The factor for the alarm threshold	4	LONG	51	82	R/W

	value is 0.001. Example: If you need to set the alarm threshold value to 10.123, the actual value written to the register is 10123. (10123 * 0.001 = 10.123)					
Reset historical data	0 = reset max. demand 5 = reset SOE information 7 = reset relay control record 8 = reset monthly energy consumption 9 = reset daily energy consumption (KPPA is asked)	2	UINT	56	00	W
Meter code	The code of the meter	2	HEX	56	01	R
Serial number	The serial number of the meter	4	ULONG	56	02	R
Software version number	Software version number : XX.YY Data definition : The first byte represents XX, and the second byte represents YY	2	HEX	56	04	R
Hardware version number	Hardware version number : XX.YY Data definition : The first byte represents XX, and the second byte represents YY	2	HEX	56	05	R
version number of displayed	version number of displayed : XX.YY Data definition : The first byte represents XX, and the second byte represents YY	2	HEX	56	06	R
Fault code	The data format is defined as follows : Bit 0: indicates the fault bit of the L1 phase relay. 1 indicates that the relay cannot be disconnected, and 0 indicates that there is no fault. Bit 1: indicates the fault bit of the L2 phase relay. 1 indicates that the relay cannot be disconnected, and 0 indicates that there is no fault. Bit 2: indicates the fault bit of the L3 phase relay. 1 indicates that the relay cannot be disconnected, and 0 indicates that there is no fault. Bit 3: Indicates the battery fault. 1 indicates that the battery voltage is too low. 0 indicates that the battery voltage is normal. Bits 4 to 7 are always 0.	2	HEX	56	07	R
Control Relay	Write FF 00 to the register to control the connect of the relay; Write 00 00 to the register to control the	2	HEX	56	09	R/W

	disconnect of the relay;					
Relay control record class						
Relay control record - 01	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	20	R
Relay control record - 02	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	24	R
Relay control record - 03	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	28	R
Relay control record - 04	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	2C	R
Relay control record - 05	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean</p>	8	Custom	57	30	R

	control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.					
Relay control record - 06	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	34	R
Relay control record - 07	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	38	R
Relay control record - 08	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	3C	R
Relay control record - 09	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	40	R

Relay control record - 10	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	44	R
Relay control record - 11	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	48	R
Relay control record - 12	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	4C	R
Relay control record - 13	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	50	R
Relay control record - 14	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p>	8	Custom	57	54	R

	<p>“year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>					
Relay control record - 15	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	58	R
Relay control record - 16	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	5C	R
Relay control record - 17	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	60	R
Relay control record - 18	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	64	R
Relay control record - 19	<p>The format is: control type-year-month-date -hour-</p>	8	Custom	57	68	R

	min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.					
Relay control record - 20	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	6C	R
Relay control record - 21	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	70	R
Relay control record - 22	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	74	R
Relay control record - 23	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the	8	Custom	57	78	R

	control relay action, and its data format is BCD.					
Relay control record - 24	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	7C	R
Relay control record - 25	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	80	R
Relay control record - 26	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	84	R
Relay control record - 27	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	88	R
Relay control record - 28	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean</p>	8	Custom	57	8C	R

	control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.					
Relay control record - 29	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	90	R
Relay control record - 30	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	94	R
Relay control record - 31	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	98	R
Relay control record - 32	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	9C	R

Relay control record - 33	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	A0	R
Relay control record - 34	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	A4	R
Relay control record - 35	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	A8	R
Relay control record - 36	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	AC	R
Relay control record - 37	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p>	8	Custom	57	B0	R

	<p>“year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>					
Relay control record - 38	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	B4	R
Relay control record - 39	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	B8	R
Relay control record - 40	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	BC	R
Relay control record - 41	<p>The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	C0	R
Relay control record - 42	<p>The format is: control type-year-month-date -hour-</p>	8	Custom	57	C4	R

	min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.					
Relay control record - 43	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	C8	R
Relay control record - 44	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	CC	R
Relay control record - 45	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the control relay action, and its data format is BCD.	8	Custom	57	D0	R
Relay control record - 46	The format is: control type-year-month-date -hour-min-second. Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect. “year-month-date -hour-min-second “ indicates the occurrence time of the	8	Custom	57	D4	R

	control relay action, and its data format is BCD.					
Relay control record - 47	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	D8	R
Relay control record - 48	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	DC	R
Relay control record - 49	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	E0	R
Relay control record - 50	<p>The format is: control type-year-month-date -hour-min-second.</p> <p>Control type is 2 byte, FF 00 is mean control relay connect, 00 00 is mean control relay disconnect.</p> <p>“year-month-date -hour-min-second” indicates the occurrence time of the control relay action, and its data format is BCD.</p>	8	Custom	57	E4	R
SOE Event logging class						
SOE-01 (3)	<p>SOE information; the format is: type-event cause-alarm value-year-month-date -hour-min-second</p>	12	Custom	53	00	R

	<p>Note:</p> <p>Type : 1 byte, BCD.</p> <p>event cause : 1 byte, BCD.</p> <p>alarm value : 4 byte, LONG, factor is 0.001.</p> <p>year-month-date -hour-min-second : 6 byte, BCD.</p> <p>Note: The unit of alarm value please refer to Table 2.</p>					
SOE-02 (3)	<p>SOE information; the format is:</p> <p>type-event cause-alarm value-year-month-date -hour-min-second</p> <p>Note:</p> <p>Type : 1 byte, BCD.</p> <p>event cause : 1 byte, BCD.</p> <p>alarm value : 4 byte, LONG, factor is 0.001.</p> <p>year-month-date -hour-min-second : 6 byte, BCD.</p> <p>Note: The unit of alarm value please refer to Table 2.</p>	12	Custom	53	06	R
SOE-03 (3)	<p>SOE information; the format is:</p> <p>type-event cause-alarm value-year-month-date -hour-min-second</p> <p>Note:</p> <p>Type : 1 byte, BCD.</p> <p>event cause : 1 byte, BCD.</p> <p>alarm value : 4 byte, LONG, factor is 0.001.</p> <p>year-month-date -hour-min-second : 6 byte, BCD.</p> <p>Note: The unit of alarm value please refer to Table 2.</p>	12	Custom	53	0C	R
SOE-04 (3)	<p>SOE information; the format is:</p> <p>type-event cause-alarm value-year-month-date -hour-min-second</p> <p>Note:</p> <p>Type : 1 byte, BCD.</p> <p>event cause : 1 byte, BCD.</p> <p>alarm value : 4 byte, LONG, factor is 0.001.</p> <p>year-month-date -hour-min-second : 6 byte, BCD.</p>	12	Custom	53	12	R

	Note: The unit of alarm value please refer to Table 2.					
SOE-05 (3)	<p>SOE information; the format is: type-event cause-alarm value-year-month-date -hour-min-second</p> <p>Note: Type : 1 byte, BCD. event cause : 1 byte, BCD. alarm value : 4 byte, LONG, factor is 0.001. year-month-date -hour-min-second : 6 byte, BCD.</p> <p>Note: The unit of alarm value please refer to Table 2.</p>	12	Custom	53	18	R
SOE-06 (3)	<p>SOE information; the format is: type-event cause-alarm value-year-month-date -hour-min-second</p> <p>Note: Type : 1 byte, BCD. event cause : 1 byte, BCD. alarm value : 4 byte, LONG, factor is 0.001. year-month-date -hour-min-second : 6 byte, BCD.</p> <p>Note: The unit of alarm value please refer to Table 2.</p>	12	Custom	53	1E	R
SOE-07 (3)	<p>SOE information; the format is: type-event cause-alarm value-year-month-date -hour-min-second</p> <p>Note: Type : 1 byte, BCD. event cause : 1 byte, BCD. alarm value : 4 byte, LONG, factor is 0.001. year-month-date -hour-min-second : 6 byte, BCD.</p> <p>Note: The unit of alarm value please refer to Table 2.</p>	12	Custom	53	24	R
SOE-08 (3)	<p>SOE information; the format is: type-event cause-alarm value-year-month-date -hour-min-second</p> <p>Note:</p>	12	Custom	53	2A	R

	Type : 1 byte, BCD. event cause : 1 byte, BCD. alarm value : 4 byte, LONG, factor is 0.001. year-month-date -hour-min-second : 6 byte, BCD. Note: The unit of alarm value please refer to Table 2.					
SOE-09 (3)	SOE information; the format is: type-event cause-alarm value-year-month-date -hour-min-second Note: Type : 1 byte, BCD. event cause : 1 byte, BCD. alarm value : 4 byte, LONG, factor is 0.001. year-month-date -hour-min-second : 6 byte, BCD. Note: The unit of alarm value please refer to Table 2.	12	Custom	53	30	R
SOE-10 (3)	SOE information; the format is: type-event cause-alarm value-year-month-date -hour-min-second Note: Type : 1 byte, BCD. event cause : 1 byte, BCD. alarm value : 4 byte, LONG, factor is 0.001. year-month-date -hour-min-second : 6 byte, BCD. Note: The unit of alarm value please refer to Table 2.	12	Custom	53	36	R

Note:

(1) Table-1 Alarm object index table

No.	Alarm object	No.	Alarm object	No.	Alarm object
0	L1-N voltage	11	Average current	22	L2 apparent power
1	L2-N voltage	12	Neutral current	23	L3 apparent power
2	L3-N voltage	13	L1 active power	24	Total apparent power
3	Average voltage of L-N	14	L2 active power	25	Frequency
4	L1-2 voltage	15	L3 active power	26	Per phase L-N voltage

5	L2-3 voltage	16	Total active power	27	Per phase L-L voltage
6	L3-1 voltage	17	L1 reactive power	28	Per phase current
7	Average voltage of L-L	18	L2 reactive power	29	Per phase active power
8	L1 current	19	L3 reactive power	30	Per phase reactive power
9	L2 current	20	Total reactive power	31	Per phase apparent power
10	L3 current	21	L1 apparent power		

Note: If the alarm parameter set by the meter is per phase parameter, the meter will trigger the alarm action (disconnect the relay) as long as any phase parameter of the three-phase parameter is detected to exceed the set alarm threshold.

(2) Table-2 Unit of alarm object

Alarm parameter	Unit	Alarm parameter	Unit	Alarm parameter	Unit
L1-N voltage	0.001V	L3 current	0.001A	Total reactive power	0.001kvar
L2-N voltage	0.001V	Average current	0.001A	L1 apparent power	0.001kVA
L3-N voltage	0.001V	Neutral current	0.001A	L2 apparent power	0.001kVA
Average voltage of L-N	0.001V	L1 active power	0.001kW	L3 apparent power	0.001kVA
L1-2 voltage	0.001V	L2 active power	0.001kW	Total apparent power	0.001kVA
L2-3 voltage	0.001V	L3 active power	0.001kW	Frequency	0.001kHz
L3-1 voltage	0.001V	Total active power	0.001kW		
Average voltage of L-L	0.001V	L1 reactive power	0.001kvar		
L1 current	0.001A	L2 reactive power	0.001kvar		
L2 current	0.001A	L3 reactive power	0.001kvar		

(3) SOE information format: type-event cause-alarm value-year-month-date -hour-min-second;

Type: 0~67, 99 (Table-3)

Event cause: 0 = null, 1 indicates that the event is an alarm event.

Alarm value: The value that causes an alarm

Year: the year when event happened. For example: 2017, year=17;

Month: the month when event happened.

Date: the date when event happened;

Hour: the hour when event happened;

Min: the Minute when event happened

Second: the second when event happened

(4) Table-3 Event descriptions

Type	Event description	Type	Event description	Type	Event description
0	L1-N voltage alarm	13	L1 active power alarm	60	L1 phase relay can not be disconnected alarm
1	L2-N voltage alarm	14	L2 active power alarm	61	L2 phase relay can not be disconnected alarm
2	L3-N voltage alarm	15	L3 active power alarm	62	L1 and L2 phase relay can not be disconnected alarm
3	Average voltage of L-N alarm	16	Total active power alarm	63	L3 phase relay can not be disconnected alarm
4	L1-2 voltage alarm	17	L1 reactive power alarm	64	L1 and L3 phase relay can

Example:

1, Read Input Registers

Example: Read "Phase 1 line to neutral volts"

Request: 01 04 00 00 00 02 71 CB

Where, 01 = Meter address

04 = Function code

00 = High byte of registers starting address

00 = Low byte of registers starting address

00 = High byte of registers number

02 = Low byte of registers number

71 = CRC Low

CB = CRC High

Response: 01 04 04 43 66 33 34 1B 38

Where, 01 = Meter address

04 = Function code

04 = Byte count

43 = Data, (High Word, High Byte)

66 = Data, (High Word, Low Byte)

33 = Data, (Low Word, High Byte)

34 = Data, (Low Word, Low Byte)

1B = CRC Low

38 = CRC High

Note: 43 66 33 34(Hex) = 230.2 (Floating point)

Example: Read "Phase 1 line to neutral volts" (ULONG Format)

Request: 01 03 00 00 00 02 C4 B0

Where, 01 = Meter address

03 = Function code

00 = High byte of registers starting address

00 = Low byte of registers starting address

00 = High byte of registers number

02 = Low byte of registers number

C4 = CRC Low

B0 = CRC High

Response: 01 03 04 00 00 61 AA 53 DC

Where, 01 = Meter address

04 = Function code

04 = Byte count

00 = Data, (High Word, High Byte)

00 = Data, (High Word, Low Byte)

61 = Data, (Low Word, High Byte)

AA = Data, (Low Word, Low Byte)

53 = CRC Low

DC = CRC High

Note: 00 00 61 AA(Hex) = 25002(ULONG) * 0.01V = 250.02V

2, Read Holding Registers

Example: Read "Slide time"

Request: 01 03 50 03 00 01 65 0A

Where, 01 = Meter address

03 = Function code

50 = High byte of registers starting address

03 = Low byte of registers starting address

00 = High byte of registers number

01 = Low byte of registers number

65 = CRC Low

0A = CRC High

Response: 01 03 02 00 05 78 47

Where, 01 = Meter address

03 = Function code

04 = Byte Count

00 = Data, (High Byte)

05 = Data, (Low Byte)

78 = CRC Low

47 = CRC High

Note: 00 05 (Hex) = 5 (UINT)

3, Write Holding Registers

Example: Write "Demand Period" = 30

Request: 01 10 50 02 00 01 02 00 1E 77 BF

Where, 01 = Meter address

10 = Function code

50 = High byte of registers starting address

02 = Low byte of registers starting address

00 = High byte of registers number

01 = Low byte of registers number

02 = Byte Count

00 = Data, (High Byte)

1E = Data, (Low Byte)

77 = CRC Low

BF = CRC High

Note: 00 1E (Hex) = 30(UINT)

Response: 01 10 50 02 00 01 B1 09

Where, 01 = Meter address

10 = Function code

50 = High byte of registers starting address

02 = Low byte of registers starting address

00 = High byte of registers number

01 = Low byte of registers number

B1 = CRC Low

09 = CRC High
