Input register, function code (Hex) : 04

Register Serial Number	Enter Register Parameters				Register Start Address Hex	
	Parameter Definition	Data Length (bytes)	Parameter Definition	Data Length (bytes)	Parameter Definition	Data Length (bytes)
30001	L1-N Voltage	4	Float	V	00	00
30003	L2-N Voltage	4	Float	V	00	02
30005	L3-N Voltage	4	Float	V	00	04
30007	L1 Current	4	Float	A	00	06
30009	L2 Current	4	Float	A	00	08
30011	L3 Current	4	Float	A	00	0A
30013	L1 Active power	4	Float	W	00	0C
30015	L2 Active power	4	Float	W	00	0E
30017	L3 Active power	4	Float	W	00	10
30019	L1 apparent power	4	Float	VA	00	12
30021	L2 apparent power	4	Float	VA	00	14
30023	L3 apparent power	4	Float	VA	00	16
30025	L1 reactive power	4	Float	VAr	00	18
30027	L2 reactive power	4	Float	VAr	00	1A
30029	L3 reactive power	4	Float	VAr	00	1C
30031	L1 Power factor（1）	4	Float	None	00	1E
30033	L2 Power factor（1）	4	Float	None	00	20
30035	L3 Power factor（1）	4	Float	None	00	22
30037	L1 phase angle	4	Float	Degrees	00	24
30039	L2 phase angle	4	Float	Degrees	00	26
30041	L3 phase angle	4	Float	Degrees	00	28
30043	Average phase voltage	4	Float	V	00	2A
30047	Average Current	4	Float	A	00	2E
30049	Total Current	4	Float	A	00	30
30053	Total Active power	4	Float	W	00	34
30057	Total apparent power	4	Float	VA	00	38
30061	Total reactive power	4	Float	VAr	00	3C
30063	Total Power factor（1）	4	Float	None	00	3E
30067	Total phase angle	4	Float	Degree	00	42
30071	Frequency	4	Float	Hz	00	46
30073	Import Total active energy	4	Float	kWh	00	48
30075	Export Total active energy	4	Float	kWH	00	4A
30077	Import Total reactive energy	4	Float	kVArh	00	4C

30079	Export Total reactive energy	4	Float	kVArh	00	4E
30081	Total Apparent power	4	Float	kVAh	00	50
30085	Total Active power demand （2）	4	Float	W	00	54
30087	Max.Active power demand （2）	4	Float	W	00	56
30101	apparent power demand	4	Float	VA	00	64
30103	Max.apparent power demand	4	Float	VA	00	66
30109	Total reactive power demand（2）	4	Float	VAr	00	6C
30111	Max.reactive power demand（2）	4	Float	VAr	00	6E
30201	L1-2 Voltage	4	Float	V	00	C8
30203	L2-3 Voltage	4	Float	V	00	CA
30205	L3-1 Voltage	4	Float	V	00	CC
30207	Average line Voltage	4	Float	V	00	CE
30225	Null line Current	4	Float	A	00	E0
30259	L1 Current demand	4	Float	A	01	02
30261	L2 Current demand	4	Float	A	01	04
30263	L3 Current demand	4	Float	A	01	06
30265	L1 Max.Current demand	4	Float	A	01	08
30267	L2 Max.Current demand	4	Float	A	01	0A
30269	L3 Max.Current demand	4	Float	A	01	0C
30343	Total active energy	4	Float	kWh	01	56
30345	Total reactive energy	4	Float	kVArh	01	58

Remark:

(1) Power factor display will adjust automatically according to the Current direction.

Negative value indicates Output Current, while positive value represents Input Current.

(2) the power demand defaults to the Input value minus the Output value

Holding register, function code (Hex) : 03 / 10

Register serial number	**Parameter**	**Register start address （Hex）**		**Values description**	**Mode**
		high byte	**low byte**		
40003	Demand period	00	02	The set range:0~60，unit：minute，Default 60。 0 Stands for real time updates, which are updated every second. **data length : 4 byte** **data type : Float**	Read/ write

40005	Sliding time	00	04	The set range：1 ~ （demand period-1），unit: min，Default 1. **data length : 4 byte** **data type : Float**	Read/ write
40013	Pulse 1 output pulse width	00	OC	The set range：60, 100, 200，unit: ms，Default 100. Note: if constant of pulse 1=1000imp/kWh， then the pulse width will be set to 35ms and can't be changed. **data length : 4 byte** **data type : Float**	Read/ write
40023	Pulse 1 Pulse Constant	00	16	The set range 0~3，Default 0 0 is 1000 imp/kWh 1 is 100 imp/kWh 2 is 10 imp/kWh 3 is 1 imp/kWh Note: if constant of pulse 1=1000imp/kWh， then the pulse width will be set to 35ms and can't be changed. **data length : 4 byte** **data type : Float**	Read/ write
40025	Password	00	18	The set range 0000 ~ 9999，Default 1000 **data length : 4 byte** **data type : Float**	Read/ write
40059	Auto wheel display time	00	3A	The set range 0~30，unit：second，Default 0. 0 means no auto wheel display。 **data length : 4 byte** **data type : Float**	Read/ write
40061	Backlight time	00	3C	The set range 0 ~ 121，unit：minute，Default 60. 0 means the backlight is always bright. 121 means that the backlight is always off. **data length : 4 byte** **data type : Float**	Read/ write
40087	Pulse 1 output type	00	56	Values can be set: 2, 6, Default 2. 2 represents the output type of pulse 1 is total active energy. 6 represents the output type of pulse 1 is total reactive energy. **data length : 4 byte** **data type : Float**	Read/ write
40769	DI filter time	03	00	DI filter time (0ms: 0~255) , Default 100ms **Length : 2 byte** **Data Format : unsigned int16**	r/w
40770	DI-1 count	03	01	DI-1 count **Length : 4 byte** **Data Format : unsigned int32** **Write 0 to reset the count. No response if write other value.**	r/w
40772	DI-2 count	03	03	DI-2 count	r/w

				Length : 4 byte **Data Format : unsigned int32** **Write 0 to reset the count. No response if write other value**	
41025	Alarm object (1)	04	00	The set range: 0~29, and 255, Default 255. 255 means no alarm object. **data length : 2 byte** **data type : unsigned int16**	Read/ write
41027	Alarm value	04	02	When the measured value of the alarm object is larger than the threshold value, the alarm is triggered and the relay is automatically disconnected. Note: The relay must be close manually to remove the alarm when alarm occur and relay open automatically. **data length : 4 byte** **data type : Float**	Read/ write
461457	Clear historical data	F0	10	**00 00 = reset demand info** **00 06 = reset DI counts** **data length: 2 byte** **data type: Hex**	write only
463777	Energy accumulation mode	F9	20	The value can be set: 00 01 ~ 00 05 00 01 represents the total energy = Import energy 0002 represents the total energy = Import energy + export energy 0003 represents the total energy = Import energy – export energy 0004 represents the total energy= export energy 00 05 represents the total energy = export energy – import energy **data length : 2 byte** **data type: Hex**	Read/ write
464511	Meter fault code	FB	FE	00 00 means there is no failure 00 01 means can't open the relay of phase A 00 02 means can't open the relay of phase B 00 03 means can't open the relay of phase A, B 00 04 means can't open the relay of phase C 00 05 means can't open the relay of phase A, C 00 06 means can't open the relay of phase B, C 00 07 means can't open the relay of phase A, B, C **data length : 2 byte** **data type : Hex**	read only
464513	Serial number	FC	00	Serial number of meter **data length : 4 byte** **data type : unsigned int32**	read only

464769	Relay control command	FD	00	Values can be set: 00 00, FF 00. FF 00 represents to close relay of three phase meanwhile; 00 00 represents to open relay of three phase meanwhile; Note: Please close relay by this command to remove the alarm when the alarm occurs. **Length : 2 byte** **Data Format : Hex**	write only
464771	Relay independent control command	FD	02	Data Format: The first byte represents relay of phase A; The second byte represents relay of phase B; The third byte represents relay of phase C; The fourth byte is reserved, meaningless, write 00 when set, return 00 when read Note: writing FF means to close relay, write 00 means to open relay when setting. When reading, return FF means the relay is currently closed and return 00 means the relay is currently opened. **Length : 4 byte** **Data Format : Hex**	Read/ write
465025	Active upload mode(1)	FE	00	Active upload mode 00 00 = active-upload off 00 55 = active-upload on **Length : 2 byte** **Data Format : Hex** (KPPA is asked)	r/w
465026	Interval of Active upload (1)	FE	01	Interval of Active upload Range：0~255，Unit：min **Length : 2 byte** **Data Format : Hex** (KPPA is asked)	r/w
465027	Active upload parameters (2)	FE	02	Active upload parameters Range：00 ~ 49，FF = invalid parameter, won't be uploaded An active upload window supports up to 30 parameter upload operations. **Length : 30 byte** **Data Format : Hex** (KPPA is asked)	r/w

465043	Number of Registers in each active upload command (3)	FE	12	Under the active upload mode, to read/write how many registers are going to be read in one command. Range：3 ~ 8，default：3 **Length : 2 byte** **Data Format : Hex** (KPPA is asked)	r/w
465044	Offline detection time (4)	FE	13	LORAWAN Offline detection time。 Range：0~255, Unit：Min 0 = no detection。 **Length : 2 byte** **Data Format : Hex** (KPPA is asked)	r/w
465045	LoRaWAN Confirm mode	FE	14	LORAWAN message transfer mode 00 00 = Non-confirm mode 00 55 = confirm mode **Length : 2 byte** **Data Format : Hex** (KPPA is asked)	r/w
465046	Active Upload parameters (5)	FE	15	Active Upload parameters bit 0: won't be uploaded bit 1: uploaded **Length : 10 byte** **Data Format : Hex** (KPPA is asked)	r/w
465051	ADR	FE	1A	Enable/Disable LoRaWAN_ADR function 00 00 = Disable LoRaWAN_ADR 00 01 = Enable LoRaWAN_ADR **Length : 2 byte** **Data Format : Hex**	r/w

Note:

Reference number	Alarm parameter	Reference number	Alarm parameter	Reference number	Alarm parameter
0	L1-N Voltage	10	L3 Current	20	Total reactive power
1	L2-N Voltage	11	Average Current	21	L1 apparent power
2	L3-N Voltage	12	Null line Current	22	L2 apparent power
3	Average phase Voltage	13	L1 Active power	23	L3 apparent power
4	L1-2 Voltage	14	L2 Active power	24	Total apparent power
5	L2-3 Voltage	15	L3 Active power	25	Frequency

6	L3-1 Voltage	16	Total Active power		
7	Average line Voltage	17	L1 reactive power		
8	L1 Current	18	L2 reactive power		
9	L2 Current	19	L3 reactive power		

(1) Table-1 Alarm object

SDM530MCT-LORAWAN Active Upload Parameters							
Index Number				Parameter	Unit	Data format	Length (Byte)
No.	Hex	Byte	bit				
0	00	Byte[0]	Bit 0	L1-N Voltage	V	Float	4
1	01	Byte[0]	Bit 1	L2-N Voltage	V	Float	4
2	02	Byte[0]	Bit 2	L3-N Voltage	V	Float	4
3	03	Byte[0]	Bit 3	L1-2 Voltage	V	Float	4
4	04	Byte[0]	Bit 4	L2-3 Voltage	V	Float	4
5	05	Byte[0]	Bit 5	L3-1 Voltage	V	Float	4
6	06	Byte[0]	Bit 6	Frequency	Hz	Float	4
7	07	Byte[0]	Bit 7	L1 Current	A	Float	4
8	08	Byte[1]	Bit 0	L2 Current	A	Float	4
9	09	Byte[1]	Bit 1	L3 Current	A	Float	4
10	0A	Byte[1]	Bit 2	Total Current	A	Float	4
11	0B	Byte[1]	Bit 3	Neutral Current	A	Float	4
12	0C	Byte[1]	Bit 4	L1 Power factor	None	Float	4
13	0D	Byte[1]	Bit 5	L2 Power factor	None	Float	4
14	0E	Byte[1]	Bit 6	L3 Power factor	None	Float	4
15	0F	Byte[1]	Bit 7	Total Power factor	None	Float	4
16	10	Byte[2]	Bit 0	L1 Active power	W	Float	4
17	11	Byte[2]	Bit 1	L2 Active power	W	Float	4
18	12	Byte[2]	Bit 2	L3 Active power	W	Float	4
19	13	Byte[2]	Bit 3	Total Active power	W	Float	4
20	14	Byte[2]	Bit 4	L1 Reactive power	var	Float	4
21	15	Byte[2]	Bit 5	L2 Reactive power	var	Float	4
22	16	Byte[2]	Bit 6	L3 Reactive power	var	Float	4
23	17	Byte[2]	Bit 7	Total Reactive power	var	Float	4
24	18	Byte[3]	Bit 0	L1 Apparent power	VA	Float	4
25	19	Byte[3]	Bit 1	L2 apparent power	VA	Float	4
26	1A	Byte[3]	Bit 2	L3 apparent power	VA	Float	4
27	1B	Byte[3]	Bit 3	Total apparent power	VA	Float	4
28	1C	Byte[3]	Bit 4	L1 Phase Angle	Degrees	Float	4
29	1D	Byte[3]	Bit 5	L2 Phase Angle	Degrees	Float	4
30	1E	Byte[3]	Bit 6	L3 Phase Angle	Degrees	Float	4
31	1F	Byte[3]	Bit 7	System Phase Angle	Degrees	Float	4
32	20	Byte[4]	Bit 0	Maximum total system power demand	W	Float	4

33	21	Byte[4]	Bit 1	Maximum total system reactive power demand	var	Float	4
34	22	Byte[4]	Bit 2	Maximum total system apparent power demand	VA	Float	4
35	23	Byte[4]	Bit 3	Maximum L1 current demand	A	Float	4
36	24	Byte[4]	Bit 4	Maximum L2 current demand	A	Float	4
37	25	Byte[4]	Bit 5	Maximum L3 current demand	A	Float	4
38	26	Byte[4]	Bit 6	Import Active Energy	kWh	Float	4
39	27	Byte[5]	Bit 7	Export Active Energy	kWh	Float	4
40	28	Byte[5]	Bit 0	Total kWh	kWh	Float	4
41	29	Byte[5]	Bit 1	Import Reactive Energy	kvarh	Float	4
42	2A	Byte[5]	Bit 2	Export Reactive Energy	kvarh	Float	4
43	2B	Byte[5]	Bit 3	Total kvarh	kvarh	Float	4
44	2C	Byte[5]	Bit 4	Total kvah	kVAh	Float	4
45	2D	Byte[5]	Bit 5	Relay state The first byte represents relay of phase A; The second byte represents relay of phase B; The third byte represents relay of phase C; return FF means the relay is currently closed and return 00 means the relay is currently opened. Alarm state The fourth byte 0x01:Alarming 0x00:No alarm		**Hex**	4
46	2E	Byte[5]	Bit 6	DI-1 count		**Hex**	4
47	2F	Byte[6]	Bit 7	DI-2 count		**Hex**	4

Read the coil status, function code (Hex) : 01

Register serial number	**Parameter**	**Register start address（Hex）**		**Values description**	**Mode**
		high byte	**low byte**		
00001	DO-1 status	00	00	1 means close and 0 means open Note: DO-1 represents the relay of phase A. **data length : 1 bit**	read only

				data type: Binary	
00002	DO-2 status	00	01	1 means close and 0 means open Note: DO-2 represents the relay of phase B. **data length : 1 bit** **data type: Binary**	read only
00003	DO-3 status	00	02	1 means close and 0 means open Note: DO-3 represents the relay of phase C. **data length : 1 bit** **data type: Binary**	read only

Read Input Status, function code 02

Address Register	Parameter Number	Parameter	Modbus Protocol Start Address Hex		Valid range	Mode
			High Byte	Low Byte		
10001	1	DI-1 status	00	00	DI1 status, 1=ON, 0=OFF **Length : 1 bit** **Data Format :Binary**	ro
10002	2	DI-2 status	00	01	DI2 status, 1=ON, 0=OFF **Length : 1 bit** **Data Format :Binary**	ro

4.4 Control coil, function code (Hex) : 05

Register serial number	**Parameter**	**Register start address（Hex）**		**Values description**	**Mode**
		high byte	**low byte**		
00001	Control DO-1	00	00	FF 00 represents to close relay; 00 00 represents to open relay; Note: DO-1 represents the relay of phase A **data length :2 byte** **data type :Hex**	write only
00002	Control DO-2	00	01	FF 00 represents to close relay; 00 00 represents to open relay; Note: DO-2 represents the relay of phase B **data length :2 byte** **data type :Hex**	write only
00003	Control DO-3	00	02	FF 00 represents to close relay; 00 00 represents to open relay; Note: DO-3 represents the relay of phase C **data length :2 byte**	write only

					data type :Hex	

4.5 For example

Read the input register

Example: read "L1 – N Voltage"

Send: 01 04 00 00 00 02 71 CB

Where, 01 = modbus address of the meter

04 = function code

00 = high byte of register start address

00 = low byte of register start address

00 = high byte of register number

02 = low byte of register number

71 = low byte of CRC check code

High byte of CB = CRC check code

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

Where, 01 = modbus address of the meter

04 = function code

04 = number of bytes returned

43 = data, (high bytes of high word)

66 = data, (low bytes of high word)

33 = data, (high bytes of low word)

34 = data, (low bytes of low word)

1B = low byte of CRC check code

38 = high byte of CRC check code

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

2. Read hold register

Example: read "slip time"

Send: 001 03 0004 0002 85 CA

Where, 01 = modbus address of the meter

03 = function code

00 = high byte of register start address

04 = low byte of register start address

00 = high byte of register number

02 = low byte of register number

85 = low byte of CRC check code

CA = high byte of CRC check code

Return: 01 03 04 40 A0 00 00 EF D1

Where, 01 = modbus address of the meter

03 = function code

04= number of bytes returned

40 = data, (high byte of high word)

A0 = data, (low bytes of high word)

00 = data, (high bytes of low word)

00 = data, (low byte of low word)

EF = low byte of CRC check code

D1 = high byte of CRC check code

Note: 40 A0 00 00 (Hex) = 5 (Floating point)

3. Write hold register

Example: set the "demand period" = 60 min

Send: 01 10 00 02 00 02 04 42 70 00 00 00 67 D5

Where, 01 = modbus address of the meter

10 = function code

00 = high byte of register start address

02 = low byte of register start address

00 = high byte of register number

02 = low byte of register number

04 = number of bytes written to data

42 = data, (high byte of high word)

70 = data, (low bytes of high word)

00 = data, (high bytes of low word)

00 = data, (low byte of low word)

67 = low byte of CRC check code

D5 = high byte of CRC check code

Note: 42 70 00 00 (Hex) = 60 (Floating point)

Return: 01 10 00 02 00 02 E0 08

Where, 01 = modbus address of the meter

10 = function code

00 = high byte of register start address

02 = low byte of register start address

00 = high byte of register number

02 = low byte of register number

E0 = low byte of CRC check code

08 = high byte of CRC check code

4. Read the relay status

Example: read DO-1, DO-2, DO-3 status

Send: 01 01 00 00 00 03 7C 0B

Where, 01 = modbus address of the meter

01 = function code

00 = high byte of register start address

00 = low byte of register start address

00 = reads the number of high bytes of DO

03 = read the low number of DO bytes

7C = low byte of CRC check code

0B = high byte of CRC check code

Return: 01 01 01 05 91 8B

Where, 01 = modbus address of the meter

01 = function code

01 = the number of bytes returned

05 = data (DO state)

91 = low byte of CRC check code

8B = high byte of CRC check code

Description: data 0x05 = 0000 0101 (Binary Value).

Bit 0 represents status of DO-1. Bit 0 = 1 means DO-1 is closed; Bit 0 = 0 means DO-1 is opened.

Bit 1 represents status of DO-2. Bit 1 = 1 means DO-2 is closed; Bit 1 = 0 means DO-2 is opened.

Bit 2 represents status of DO-3. Bit 2 = 1 means DO-3 is closed; Bit 2 = 0 means DO-3 is opened.

5. Control relay

Example: close DO-1

Send: 01 05 00 00 FF 00 8C 3A

Where, 01 = modbus address of the meter

05 = function code

00 = high byte of register start address

00 = low byte of register start address

FF = DO controls high data bytes

00 = DO control command data low byte

8C = low byte of CRC check code

3A = high byte of CRC check code

Return: 01 05 00 00 FF 00 8C 3A

Where, 01 = modbus address of the meter

05 = function code

00 = high byte of register start address

00 = low byte of register start address

FF = DO controls high data bytes

00 = DO control command data low byte

8C = low byte of CRC check code

3A = high byte of CRC check code