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1 Modbus Overview

1.1 Function Overview

The multifunctional smart circuit breaker adopts the standard communication protocol - Modbus-RTU, which is applicable to MT61GP / MT61GR. Programmatically or manually, the baud rate can be set to 9600, 19200, etc.

1.2 Modbus Communication Settings

Before communicating with the device using the Modbus protocol, configure the following settings through the display screen:

Parameters	Valid Value	Default Value
Baud rate	9600	9600
	19200	
	38400	
Data bit	8	8
Check bit	Odd	No check
	Even	
	No check	
Stop bit	1	1
Address	1–247	1

1.3 Command Request Format

Slave address	Function code	Command	CRC check
8-Bits	8-Bits	N×8-Bits	16-Bits Checking

1.4 Function Code

Function codes are used to instruct the device how to handle the command. The following table shows the available function codes and their descriptions.

Function Code		Function Code Name	Function
Decimal	Hexadecimal		
3	03H	Read holding register	Used to read parameters
6	06H	Write a single holding register	Used to write parameters
16	10H	Write multiple registers	Used to configure parameters

1.5 Register List Format

The register table contains the following:

Register	Register	Operation	Size	Type	Unit	Description
Alias	Address	R/W				

- Register alias: used to refer to the meaning of the register
- Register address: Modbus data address. The data address in this manual is in decimal format.
- Operation: Indicates the operation that can be performed on the register
- Size: Indicates how many 16-bit data are occupied
- Type: The type of data encoding
- Unit: The unit of the register value
- Description: Introduce the function of this register

1.6 Data Type List

The following table lists the data types used in this manual.

Type	Description	Range
UInt16	Unsigned 16-bit integer	0–65535
Int16	Signed 16-bit integer	-32768–+32767
UInt32	Unsigned 32-bit integer	0–4 294 967 295
UInt64	Unsigned 64-bit integer	0–18 446 744 073 709 551 615
UTF8	8-bit UTF encoding	Multibyte Unicode encoding
Float32	32-bit floating point	Standard IEEE floating point data (single precision)
Bitmap	–	–
Date Time	Time type	-

1.7 Date Time Detailed Explanation

Communication LED Indicates the communication status between the multi-function smart circuit breaker and the main device as follows.

Byte	Bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
1	Reserved (0)							Year (00–99, starting from 2000)								
2	Month (1–12)							Day (1–31)								
3	Hour (0–23)							Minute (0–59)								
4	Millisecond (0–59999)															

1.8 Configuration via Modbus-RTU

You can use function code 6 and function code 16 to write commands to the device and configure parameters.

Device parameters can only be configured by writing corresponding data to the "Configuration Command Register".

1.9 Configuration Command Request

The following table lists the Modbus request format for configuration commands.

Slave address 8 bits	Function code 8 bits	Configuration command register address 16 bits		Configuration command register number 16 bits		Data 8 bits	Commands (16 bits) X N				CRC check (16bits)	
1-247	16	High 8 bits	Low 8 bits	High 8 bits	Low 8 bits	N×2	Command		Command parameter		Low 8 bits	High 8 bits
							High 8 bits	Low 8 bits	High 8 bits	Low 8 bits		

1.10 Function Code (0x10=16) Operation Instructions

Function code (0x10=16) is used to configure parameters. Its request and return data format is as follows:

1.10.1 Request Data Format

No.	Name	Type	Range (decimal)	Description
1	Address	UInt8	1-247	
2	Function code	UInt8	16	
3	Starting register address	UInt16	-	High byte first (sending order)
4	Number of registers	UInt16	1-123	High byte first (sending order)
5	Number of register bytes	UInt8		Number of registers *2
6	Register 1 value	UInt16	-	High byte first (sending order)
7	...	UInt16	-	High byte first (sending order)
8	Register n value	UInt16	-	High byte first (sending order)
9	CRC-16 check	UInt16	-	Low byte first (sending order)

1.10.2 Return Data Format

No.	Name	Type	Range (decimal)	Description
1	Address	UInt8	1-247	
2	Function code	UInt8	16	

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3	Starting register address	UInt16	300	High byte first
4	Number of registers	UInt16	1-123	High byte first
5	CRC-16 check	UInt16	-	Low byte first

1.11 Function Code (0x3=3, 0x6=6) Operation Instructions

Function code (0x03=3) is used to read register parameters, function code (0x06=6) is used to write a single register parameter.. The request and return data format is as follows:

1.11.1 Request Data Format

No.	Name	Type	Range (decimal)	Description
1	Address	UInt8	1-247	
2	Function code	UInt8	3	
3	Starting register address	UInt16	-	High byte first (sending order)
4	Number of registers	UInt16	1-125	High byte first (sending order)
5	CRC-16 check	UInt16	-	Low byte first (sending order)

1.11.2 Return Data Format

No.	Name	Type	Range (decimal)	Description
1	Address	UInt8	1-247	
2	Function code	UInt8	3	
3	Read the number of register bytes	UInt8	-	Number of read registers *2
4	Register 1 value		-	High byte first
5	...		-	High byte first
6	Register n value		-	High byte first
7	CRC-16 check	UInt16	-	Low byte first

1.12 Communication LED Indicators for Modbus Devices

The communication LED indicates the communication status between the multifunctional smart circuit breaker and the main device as follows.

Indicator Status	Description
LED red indicator flashes	Communication with the device has been established.
	NOTE: The LED will also flash if an online error occurs.
LED indicator is off	There is no active communication between the master and slave devices.

2 Register List: Device System Information

2.1 Product Information

Category	DEC address	HEX address	Name	Attribute	Register length (U16)	Data type	Unit	RW
System parameters	0	0X0000	Communication address	The reading and writing have the same meaning, 1-247 (0 means broadcast); Default 1; The modification will take effect immediately; Power-off storage;	1	UInt16	Null	R/W
System parameters	1	0X0001	Communication protocol type	Read only 0; 0 represents MODBUS communication protocol;	1	UInt16	Null	R/W
System parameters	2	0x0002	Communication baud rate, check bit	Reading and writing have the same meaning; High byte: communication baud rate 5-7	1	UInt16	Null	R/W

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				5: 9600; 6: 19200; 7: 38400; Low byte: communication check bit: 0 = none, 1 = odd, 2 = even, note: stop bit = 1 Default value 0x0501; The modification will take effect immediately; Power-off storage;				
System parameters	3	0X0003	Device running seconds	Read only; It is 0 when starting up and increases by one every second;	2	UInt32	Seconds	R
System parameters	5	0X0005	Time zone	Reading and writing have the same meaning; Default 8; -12 to +12, respectively representing UTC-12~UTC+12; The modification will	1	SIInt16	Null	R/ W

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				take effect immediately; Power-off storage;				
System parameters	6	0X0006	Unix timestamp;	Reading and writing have the same meaning; Range: depends on the production date, the setting value is to 2106/2/7 14:28:15; It takes effect immediately after writing; When the battery is charged, the time will be automatically displayed;	2	Timestamp	Seconds	R/W
System parameters	8	0X0008	Protection password	Reading and writing have the same meaning; Range: 0-9999 There is a password in the settings; default value: 0000 The positive integer composed of bit24 to bit31 is the first	2	BCD	Null	R/W

				number of the password, and the value does not exceed 9; The positive integer composed of bit16 to bit23 is the second number of the password, and the value does not exceed 9; The positive integer composed of bit8 to bit15 is the third number of the password, and the value does not exceed 9; The positive integer composed of bit0 to bit7 is the fourth number of the password, and the value does not exceed 9; A value with more than 4 digits can also be written successfully, but the				
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				value read out is only the first 4 digits. Instructions are required to indicate that only 4 digits can be written.				
Product information	10	0X000A	Supplier name	Write up to 20 English visual characters; The default value "matismart" (does not contain quotes); Power-off storage;	10	string	Null	R/ W
Product information	20	0X0014	Supplier website	Write up to 20 English visual characters; The default value "www.matismart.com" (does not contain quotes); Power-off storage;	10	string	Null	R/ W
Product information	30	0X001E	User application name: default=	Write up to 20 English visual characters; The default value "MT61" (does not	10	string	Null	R/ W

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			product model	contain quotes); Power-off storage;				
Product information	40	0X0028	Current firmware version XXYYZZ	Write up to 6 English visual characters; The default value "V1.0" (does not contain quotes); Power-off storage;	3	string	Null	R/ W
Product information	43	0X002B	Current hardwar e version XXYYZZ	Write up to 6 English visual characters; The default value "V1.0" (does not contain quotes); Power-off storage;;	3	string	Null	R/ W
Product information	46	0X002E	Current languag e version XXYYZZ	Write up to 6 English visual characters; The default value "V1.0" (does not contain quotes); Power-off storage;	3	string	Null	R/ W
Product information	49	0X0031	Device name	Write up to 20 English visual characters; The default value "MT61GP" (does not contain quotes);	10	string	Null	R/ W

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				Power-off storage;				
Product information	59	0X003B	Product code (material number)	Write up to 20 English visual characters; The default value "MT61-DLB-1753" (does not contain quotes); Power-off storage;	10	string	Null	R/W
Product information	69	0X0045	Device model	Write up to 20 English visual characters; A maximum of 10 digits can be displayed in the corresponding interface on the human-machine interface screen; The default value "MT61GP" (does not contain quotes); Power-off storage;	10	string	Null	R/W
Product information	79	0X004F	Serial number	Default value 1; 0-999999999; Power-off storage;	2	UInt32	Null	R/W
Product information	81	0X0051	Production date	Range: 2023-05-01 00:00:00 to	2	Timestamp	Null	R/W

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				2106/2/7 14:28:15;				
				Power-off storage;				

2.2 Power System

Category	DEC address	HEX address	Name	Attribute	Register length (U16)	Data type	Unit	RW
Power system information	256	0X0100	Circuit breaker poles and specifications;	Circuit breaker poles: 2P/4P (high) Single-phase default is 2, three-phase default is 4 (unit P) Circuit breaker specifications: 1-13 (low) Default 9 (represents 63A) #define BreakC_10A 1 #define BreakC_12D5A 2 #define	1	UInt16		R/W

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				BreakC_16A				
				3				
				#define				
				BreakC_20A				
				4				
				#define				
				BreakC_25A				
				5				
				#define				
				BreakC_32A				
				6				
				#define				
				BreakC_40A				
				7				
				#define				
				BreakC_50A				
				8				
				#define				
				BreakC_63A				
				9				
				#define				
				BreakC_80A				
				10				
				#define				
				BreakC_100A				
				11				
				#define				
				BreakC_125A				
				12				

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				#define BreakC_160A 13 Effective immediately, power-off storage;				
Power system information	257	0X0101	Number of phases	Range: 1, 3; Single-phase is 1, three-phase is 3; Power-off storage;	1	UInt16		R/W
Power system information	258	0X0102	Number of wires	0-65535; Single phase is 2, three phase is 4; Power-off storage;	1	UInt16		R/W
Power system information	259	0X0103	Power system	The default value is 0 for single phase and 11 for three phases; 0=1PH2W L-N; 1=1PH2W L-L; 2=1PH3W L-L with N; 3=3PH3W;	1	UInt16		R/W

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				11=3PH4W; 13=1PH4W multi L with N; Power-off storage;				
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2.3 Basic Metering Parameters

Category	DEC address	HEX address	Name	Attribute	Register length (U16)	Data type	Unit	RW
Basic metering parameters	512	0X0200	Rated voltage (rated phase voltage)	Default value 220; Range: 110, 220; Power-off storage;	2	Float32	V	R/W
Basic metering parameters	514	0X0202	Calibration meter current	Default 20; 0-655; Power-off storage;	2	Float32	A	R/W
Basic metering parameters	516	0X0204	Rated frequency	Default 50; 50, 60; Power-off storage;	1	UInt16	Hz	R/W
Basic metering parameters	517	0X0205	Remarks on pulse constants (not	Default 600; 0~65535; Power-off storage;	1	UInt16	P/kWh	R/W

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			associated with real pulse constants)					
Basic metering parameters	518	0X0206	VT number	Default 0; 0~65535; Power-off storage;	1	UInt16	1	R/W
Basic metering parameters	519	0X0207	VT primary voltage	Default 22; Power-off storage;	2	Float32	10V	R/W
Basic metering parameters	521	0X0209	VT ratio	Default 1; Power-off storage;	1	UInt16		R/W
Basic metering parameters	522	0X020A	CT number	Default 3; Power-off storage;	1	UInt16		R/W
Basic metering parameters	523	0X020B	CT primary current	Default 20; Power-off storage;	1	UInt16	A	R/W
Basic metering parameters	524	0X020C	CT ratio	Default 2000; Power-off storage;	1	UInt16		R/W

2.4 Energy Reset Date and Time

Category	DEC address	HEX address	Name	Attribute	Regist er	Data type	Unit	RW
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					length (U16)			
Energy reset date and time	526	0X020E	Energy reset date and time	Depends on the time when the energy is reset; Power-off storage;	2	Timest amp		R/W

2.5 Energy Time Zone and Time Period

Category	DEC address	HEX address	Name	Attribute	Register length (U16)	Data type	Unit	RW
Energy time zone and time period	534	0X0216	Billing time zone 0 start date;	High byte: month Low byte: day The default is 0x0101, which represents January 1st; High byte: 1~12 integer Low byte: 1~31 integer; Power-off storage;	1	UInt16		R/W
Energy time zone and time	535	0X0217	Billing time zone 0 is enabled;	The default is 1, which means enabled; Range:	1	UInt16		R/W

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period				0, disabled; 1, enable; Power-off storage;				
Energy time zone and time period	536	0X0218	Billing time zone 0 period 0 start time;	High byte: hours Low byte: minutes The default is 0x0900, which represents 09:00 00:00-23:59; Power-off storage;	1	UInt16		R/W
Energy time zone and time period	537	0X0219	Billing time zone 0 period 0 configuration;	Default high byte: 1 low byte: 0; High byte: 0/1 Low byte: 0-3; High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4; The host computer writes 1 to represent the tariff 0; The host computer writes 2 to represent the	1	UInt16		R/W

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				tariff 1; The host computer writes 3 to represent the tariff 2; The host computer writes 4 to represent the tariff 3; Power-off storage;				
Energy time zone and time period	538	0X021A	Billing time zone 0 period 1 start time;;	Default is 12:00; High byte: hours Low byte: minutes 00:00-23:59; Power-off storage;	1	UInt16		R/W
Energy time zone and time period	539	0X021B	Billing time zone 0 period 1 configuration;	Default high byte: 1; low byte: 1 High byte: 0/1 Low byte: 0-3 High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4; Power-off storage;	1	UInt16		R/W

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Energy time zone and time period	540	0X021C	Billing time zone 0 period 2 start time;;	High byte: hours Low byte: minutes Default 18:00; 00:00-23:59; Power-off storage;	1	UInt16	R/W
Energy time zone and time period	541	0X021D	Billing time zone 0 period 2 configuration;	Default high byte: 1; low byte: 0 High byte: 0/1 Low byte: 0-3; High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4; High byte: 1 Low byte: 2; Power-off storage;	1	UInt16	R/W
Energy time zone and time period	542	0X021E	Billing time zone 0 period 3 start time;;	Default 22:00; 00:00-23:59; High byte: hour Low byte: minute; Power-off storage;	1	UInt16	R/W
Energy time zone	543	0X021F	Billing time zone 0 period 3	Default high byte: 1 low byte: 3 High byte: 0/1	1	UInt16	R/W

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and time period			configuration;	Low byte: 0-3; High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4; Power-off storage;				
Energy time zone and time period	544	0X0220	Billing time zone 0 period 4 start time;;	High byte: hour Low byte: minute; Billing time zone 1 start date; Power-off storage;	1	UInt16		R/W
Energy time zone and time period	545	0X0221	Billing time zone 0 period 4 configuration;	The following rules are the same as above; The default values of the following registers are all 0; Power-off storage;	1	UInt16		R/W
Energy time zone and time period	546	0X0222	Billing time zone 0 period 5 start time;;		1	UInt16		R/W
Energy	547	0X0223	Billing time		1	UInt16		R/W

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time zone and time period			zone 0 period 5 configuration;					
Energy time zone and time period	548	0X0224	Billing time zone 0 period 6 start time;;		1	UInt16		R/W
Energy time zone and time period	549	0X0225	Billing time zone 0 period 6 configuration;		1	UInt16		R/W
Energy time zone and time period	550	0X0226	Billing time zone 0 period 7 start time;;		1	UInt16		R/W
Energy time zone and time period	551	0X0227	Billing time zone 0 period 7 configuration;		1	UInt16		R/W
Energy time zone and time period	552	0X0228	Billing time zone 1 start date;	High byte: month Low byte: day	1	UInt16		R/W

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Energy time zone and time period	553	0X0229	Billing time zone 1 is enabled;	0: Disable; 1: Enable	1	UInt16	R/W
Energy time zone and time period	554	0X022A	Billing time zone 1 period 0 start time;	High byte: hours Low byte: minutes	1	UInt16	R/W
Energy time zone and time period	555	0X022B	Billing time zone 1 period 0 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16	R/W
Energy time zone and time period	556	0X022C	Billing time zone 1 period 1 start time;	High byte: hours Low byte: minutes	1	UInt16	R/W
Energy time zone and time period	557	0X022D	Billing time zone 1 period 1 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16	R/W
Energy time zone and time	558	0X022E	Billing time zone 1 period 2 start time;	High byte: hours Low byte: minutes	1	UInt16	R/W

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period								
Energy time zone and time period	559	0X022F	Billing time zone 1 period 2 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	560	0X0230	Billing time zone 1 period 3 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	561	0X0231	Billing time zone 1 period 3 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	562	0X0232	Billing time zone 1 period 4 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	563	0X0233	Billing time zone 1 period 4 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone	564	0X0234	Billing time zone 1 period 5 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W

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and time period								
Energy time zone and time period	565	0X0235	Billing time zone 1 period 5 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	566	0X0236	Billing time zone 1 period 6 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	567	0X0237	Billing time zone 1 period 6 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	568	0X0238	Billing time zone 1 period 7 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	569	0X0239	Billing time zone 1 period 7 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time	570	0X023A	Billing time zone 2 start	High byte: month Low byte: day	1	UInt16		R/W

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zone and time period			date;					
Energy time zone and time period	571	0X023B	Billing time zone 2 is enabled;	0: Disable; 1: Enable	1	UInt16		R/W
Energy time zone and time period	572	0X023C	Billing time zone 2 period 0 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	573	0X023D	Billing time zone 2 period 0 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	574	0X023E	Billing time zone 2 period 1 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	575	0X023F	Billing time zone 2 period 1 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy	576	0X0240	Billing time	High byte: hours	1	UInt16		R/W

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time zone and time period			zone 2 period 2 start time;	Low byte: minutes				
Energy time zone and time period	577	0X0241	Billing time zone 2 period 2 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	578	0X0242	Billing time zone 2 period 3 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	579	0X0243	Billing time zone 2 period 3 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	580	0X0244	Billing time zone 2 period 4 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	581	0X0245	Billing time zone 2 period 4 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W

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Energy time zone and time period	582	0X0246	Billing time zone 2 period 5 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	583	0X0247	Billing time zone 2 period 5 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	584	0X0248	Billing time zone 2 period 6 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	585	0X0249	Billing time zone 2 period 6 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	586	0X024A	Billing time zone 2 period 7 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time	587	0X024B	Billing time zone 2 period 7 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2:	1	UInt16		R/W

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period				tariff 3; 3: tariff 4;				
Energy time zone and time period	588	0X024C	Billing time zone 3 start date;	High byte: month Low byte: day	1	UInt16		R/W
Energy time zone and time period	589	0X024D	Billing time zone 3 is enabled;	0: Disable; 1: Enable	1	UInt16		R/W
Energy time zone and time period	590	0X024E	Billing time zone 3 period 0 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	591	0X024F	Billing time zone 3 period 0 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	592	0X0250	Billing time zone 3 period 1 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time	593	0X0251	Billing time zone 3 period	High byte: 0: disable; 1: enable	1	UInt16		R/W

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zone and time period			1 configuration;	Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;				
Energy time zone and time period	594	0X0252	Billing time zone 3 period 2 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	595	0X0253	Billing time zone 3 period 2 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	596	0X0254	Billing time zone 3 period 3 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W
Energy time zone and time period	597	0X0255	Billing time zone 3 period 3 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W
Energy time zone and time period	598	0X0256	Billing time zone 3 period 4 start time;	High byte: hours Low byte: minutes	1	UInt16		R/W

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Energy time zone and time period	599	0X0257	Billing time zone 3 period 4 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16	R/W
Energy time zone and time period	600	0X0258	Billing time zone 3 period 5 start time;	High byte: hours Low byte: minutes	1	UInt16	R/W
Energy time zone and time period	601	0X0259	Billing time zone 3 period 5 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16	R/W
Energy time zone and time period	602	0X025A	Billing time zone 3 period 6 start time;	High byte: hours Low byte: minutes	1	UInt16	R/W
Energy time zone and time period	603	0X025B	Billing time zone 3 period 6 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16	R/W
Energy time zone and time	604	0X025C	Billing time zone 3 period 7 start time;	High byte: hours Low byte: minutes	1	UInt16	R/W

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period								
Energy time zone and time period	605	0X025D	Billing time zone 3 period 7 configuration;	High byte: 0: disable; 1: enable Low byte: 0: tariff 1; 1: tariff 2; 2: tariff 3; 3: tariff 4;	1	UInt16		R/W

3 Register List: Electrical Parameters

3.1 Voltage, Current, Power, Power Factor

Category	DEC address	HEX address	Name	Attribute	Data type	Register length (U16)	Unit	RW
Electrical parameters	8192	0X2000	Phase A current		Float32	2	A	R
Electrical parameters	8194	0X2002	Phase B current		Float32	2	A	R
Electrical parameters	8196	0X2004	Phase C current		Float32	2	A	R
Electrical parameters	8198	0X2006	Phase N current		Float32	2	A	R
Electrical parameters	8200	0X2008	Phase T current		Float32	2	A	R
Electrical parameters	8202	0X200A	Average current		Float32	2	A	R
Electrical parameters	8204	0X200C	Phase A voltage		Float32	2	V	R

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Electrical parameters	8206	0X200E	Phase B voltage		Float32	2	V	R
Electrical parameters	8208	0X2010	Phase C voltage		Float32	2	V	R
Electrical parameters	8210	0X2012	Average phase voltage		Float32	2	V	R
Electrical parameters	8212	0X2014	Line A-B voltage		Float32	2	V	R
Electrical parameters	8214	0X2016	Line B-C voltage		Float32	2	V	R
Electrical parameters	8216	0X2018	Line C-A voltage		Float32	2	V	R
Electrical parameters	8218	0X201A	Average line voltage		Float32	2	V	R
Electrical parameters	8220	0X201C	Phase A active power		Float32	2	kW	R
Electrical parameters	8222	0X201E	Phase B active power		Float32	2	kW	R
Electrical parameters	8224	0X2020	Phase C active power		Float32	2	kW	R
Electrical parameters	8226	0X2022	Phase T active power		Float32	2	kW	R
Electrical	8228	0X2024	Phase A		Float32	2	kvar	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

parameters			reactive power					
Electrical parameters	8230	0X2026	Phase B reactive power		Float32	2	kvar	R
Electrical parameters	8232	0X2028	Phase C reactive power		Float32	2	kvar	R
Electrical parameters	8234	0X202A	Phase T reactive power		Float32	2	kvar	R
Electrical parameters	8236	0X202C	Phase A apparent power		Float32	2	kva	R
Electrical parameters	8238	0X202E	Phase B apparent power		Float32	2	kva	R
Electrical parameters	8240	0X2030	Phase C apparent power		Float32	2	kva	R
Electrical parameters	8242	0X2032	Phase T apparent power		Float32	2	kva	R
Electrical parameters	8244	0X2034	Phase A power factor		Float32	2	1	R
Electrical parameters	8246	0X2036	Phase B power factor		Float32	2	1	R
Electrical	8248	0X2038	Phase C		Float32	2	1	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

parameters			power factor					
Electrical parameters	8250	0X203A	Phase T power factor		Float32	2	1	R
Electrical parameters	8252	0X203C	Frequency		Float32	2	Hz	R

3.2 Min./Max. Value

Category	DEC address	HEX address	Name	Attribute	Data type	Register length (U16)	Unit	RW
Min. value	13312	0X3400	Min/Max reset date/time		Timestamp	2		R
Min. value	13314	0X3402	Phase A minimum current		Float32	2	A	R
Min. value	13316	0X3404	Phase B minimum current		Float32	2	A	R
Min. value	13318	0X3406	Phase C minimum		Float32	2	A	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			current					
Min. value	13320	0X3408	Phase N minimum current		Float32	2	A	R
Min. value	13322	0X340A	Average minimum current		Float32	2	A	R
Min. value	13324	0X340C	Phase A minimum voltage		Float32	2	V	R
Min. value	13326	0X340E	Phase B minimum voltage		Float32	2	V	R
Min. value	13328	0X3410	Phase C minimum voltage		Float32	2	V	R
Min. value	13330	0X3412	Phase average minimum voltage		Float32	2	V	R
Min. value	13332	0X3414	Line A-B minimum voltage		Float32	2	V	R
Min. value	13334	0X3416	Line A-C minimum voltage		Float32	2	V	R
Min. value	13336	0X3418	Line B-C minimum voltage		Float32	2	V	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

Min. value	13338	0X341A	Line average minimum voltage		Float32	2	V	R
Min. value	13340	0X341C	Phase A minimum active power		Float32	2	kW	R
Min. value	13342	0X341E	Phase B minimum active power		Float32	2	kW	R
Min. value	13344	0X3420	Phase C minimum active power		Float32	2	kW	R
Min. value	13346	0X3422	Phase T minimum active power		Float32	2	kW	R
Min. value	13348	0X3424	Phase A minimum reactive power		Float32	2	kvar	R
Min. value	13350	0X3426	Phase B minimum reactive power		Float32	2	kvar	R
Min.	13352	0X3428	Phase C		Float32	2	kvar	R

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value			minimum reactive power					
Min. value	13354	0X342A	Phase T minimum reactive power		Float32	2	kvar	R
Min. value	13356	0X342C	Phase A minimum apparent power		Float32	2	kva	R
Min. value	13358	0X342E	Phase B minimum apparent power		Float32	2	kva	R
Min. value	13360	0X3430	Phase C minimum apparent power		Float32	2	kva	R
Min. value	13362	0X3432	Phase T minimum apparent power		Float32	2	kva	R
Min. value	13364	0X3434	Phase A minimum power factor		Float32	2		R
Min. value	13366	0X3436	Phase B minimum		Float32	2		R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			power factor					
Min. value	13368	0X3438	Phase C minimum power factor		Float32	2		R
Min. value	13370	0X343A	Phase T minimum power factor		Float32	2		R
Min. value	13372	0X343C	Minimum frequency		Float32	2	Hz	R
Max. value	13374	0X343E	Phase A maximum current		Float32	2	A	R
Max. value	13376	0X3440	Phase B maximum current		Float32	2	A	R
Max. value	13378	0X3442	Phase C maximum current		Float32	2	A	R
Max. value	13380	0X3444	Phase N maximum current		Float32	2	A	R
Max. value	13382	0X3446	Average maximum current		Float32	2	A	R
Max. value	13384	0X3448	Phase A maximum		Float32	2	V	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			voltage					
Max. value	13386	0X344A	Phase B maximum voltage		Float32	2	V	R
Max. value	13388	0X344C	Phase C maximum voltage		Float32	2	V	R
Max. value	13390	0X344E	Phase average maximum voltage		Float32	2	V	R
Max. value	13392	0X3450	Line A-B maximum voltage		Float32	2	V	R
Max. value	13394	0X3452	Line A-C maximum voltage		Float32	2	V	R
Max. value	13396	0X3454	Line B-C maximum voltage		Float32	2	V	R
Max. value	13398	0X3456	Line average maximum voltage		Float32	2	V	R
Max. value	13400	0X3458	Phase A maximum active power		Float32	2	kW	R
Max.	13402	0X345A	Phase B		Float32	2	kW	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

value			maximum active power					
Max. value	13404	0X345C	Phase C maximum active power		Float32	2	kW	R
Max. value	13406	0X345E	Phase T maximum active power		Float32	2	kW	R
Max. value	13408	0X3460	Phase A maximum reactive power		Float32	2	kvar	R
Max. value	13410	0X3462	Phase B maximum reactive power		Float32	2	kvar	R
Max. value	13412	0X3464	Phase C maximum reactive power		Float32	2	kvar	R
Max. value	13414	0X3466	Phase T maximum reactive power		Float32	2	kvar	R
Max. value	13416	0X3468	Phase A maximum		Float32	2	kva	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			apparent power					
Max. value	13418	0X346A	Phase B maximum apparent power		Float32	2	kva	R
Max. value	13420	0X346C	Phase C maximum apparent power		Float32	2	kva	R
Max. value	13422	0X346E	Phase T maximum apparent power		Float32	2	kva	R
Max. value	13424	0X3470	Phase A maximum power factor		Float32	2		R
Max. value	13426	0X3472	Phase B maximum power factor		Float32	2		R
Max. value	13428	0X3474	Phase C maximum power factor		Float32	2		R
Max. value	13430	0X3476	Phase T maximum power		Float32	2		R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			factor					
Max. value	13432	0X3478	Maximum frequency		Float32	2	Hz	R

3.3 Phase Angle

Category	DEC address	HEX address	Name	Attribute	Data type	Register length (U16)	Unit	RW
Phase angle	13434	0X347A	AB voltage angle		SInt32	2		R
Phase angle	13436	0X347C	AC voltage angle		SInt32	2		R
Phase angle	13438	0X347E	BC voltage angle		SInt32	2		R

4 Register List: Energy

4.1 Energy Metering

Category	DEC address	HEX address	Name	Register length (U16)	Attribute	Unit	Data type	RW
Energy metering	0x2400	9216	Total active energy A	4	Power-off storage	Wh	UInt64	R
Energy metering	0x2404	9220	Total active	4	Power-off storage	Wh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			energy B					
Energy metering	0x2408	9224	Total active energy C	4	Power-off storage	Wh	UInt64	R
Energy metering	0x240C	9228	Total active energy T	4	Power-off storage	Wh	UInt64	R
Energy metering	0x2410	9232	Total reactive energy A	4	Power-off storage	VARh	UInt64	R
Energy metering	0x2414	9236	Total reactive energy B	4	Power-off storage	VARh	UInt64	R
Energy metering	0x2418	9240	Total reactive energy C	4	Power-off storage	VARh	UInt64	R
Energy metering	0x241C	9244	Total reactive energy T	4	Power-off storage	VARh	UInt64	R
Energy metering	0x2420	9248	Total apparent energy A	4	Power-off storage	VAh	UInt64	R
Energy metering	0x2424	9252	Total apparent energy B	4	Power-off storage	VAh	UInt64	R
Energy metering	0x2428	9256	Total apparent energy C	4	Power-off storage	VAh	UInt64	R
Energy	0x242C	9260	Total	4	Power-off	VAh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

metering			apparent energy T		storage			
Energy metering	0x2430	9264	Active period energy A	4	Power-off storage	Wh	UInt64	R
Energy metering	0x2434	9268	Active period energy B	4	Power-off storage	Wh	UInt64	R
Energy metering	0x2438	9272	Active period energy C	4	Power-off storage	Wh	UInt64	R
Energy metering	0x243C	9276	Active period energy T	4	Power-off storage	Wh	UInt64	R
Energy metering	0x2440	9280	Reactive period energy A	4	Power-off storage	VARh	UInt64	R
Energy metering	0x2444	9284	Reactive period energy B	4	Power-off storage	VARh	UInt64	R
Energy metering	0x2448	9288	Reactive period energy C	4	Power-off storage	VARh	UInt64	R
Energy metering	0x244C	9292	Reactive period energy T	4	Power-off storage	VARh	UInt64	R
Energy metering	0x2450	9296	Apparent period energy A	4	Power-off storage	VAh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

Energy metering	0x2454	9300	Apparent period energy B	4	Power-off storage	VAh	UInt64	R
Energy metering	0x2458	9304	Apparent period energy C	4	Power-off storage	VAh	UInt64	R
Energy metering	0x245C	9308	Apparent period energy T	4	Power-off storage	VAh	UInt64	R
Energy metering	0X2460	9312	Total forward active energy A	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2464	9316	Total forward active energy B	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2468	9320	Total forward active energy C	4	Power-off storage	Wh	UInt64	R
Energy metering	0X246C	9324	Total forward active energy T	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2470	9328	Total reverse active	4	Power-off storage	Wh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			energy A					
Energy metering	0X2474	9332	Total reverse active energy B	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2478	9336	Total reverse active energy C	4	Power-off storage	Wh	UInt64	R
Energy metering	0X247C	9340	Total reverse active energy T	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2480	9344	Total forward reactive energy A	4	Power-off storage	VARh	UInt64	R
Energy metering	0X2484	9348	Total forward reactive energy B	4	Power-off storage	VARh	UInt64	R
Energy metering	0X2488	9352	Total forward reactive energy C	4	Power-off storage	VARh	UInt64	R
Energy metering	0X248C	9356	Total forward reactive energy T	4	Power-off storage	VARh	UInt64	R

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Energy metering	0X2490	9360	Total reverse reactive energy A	4	Power-off storage	VARh	UInt64	R
Energy metering	0X2494	9364	Total reverse reactive energy B	4	Power-off storage	VARh	UInt64	R
Energy metering	0X2498	9368	Total reverse reactive energy C	4	Power-off storage	VARh	UInt64	R
Energy metering	0X249C	9372	Total reverse reactive energy T	4	Power-off storage	VARh	UInt64	R
Energy metering	0X2800	10240	Total forward active energy A_T1	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2804	10244	Total forward active energy B_T1	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2808	10248	Total forward	4	Power-off storage	Wh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			active energy C_T1					
Energy metering	0X280C	10252	Total forward active energy T_T1	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2810	10256	Total reverse active energy A_T1	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2814	10260	Total reverse active energy B_T1	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2818	10264	Total reverse active energy C_T1	4	Power-off storage	Wh	UInt64	R
Energy metering	0X281C	10268	Total reverse active energy T_T1	4	Power-off storage	Wh	UInt64	R
Energy	0X2820	10272	Total	4	Power-off	Wh	UInt64	R

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metering			forward active energy A_T2		storage			
Energy metering	0X2824	10276	Total forward active energy B_T2	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2828	10280	Total forward active energy C_T2	4	Power-off storage	Wh	UInt64	R
Energy metering	0X282C	10284	Total forward active energy T_T2	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2830	10288	Total reverse active energy A_T2	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2834	10292	Total reverse active energy B_T2	4	Power-off storage	Wh	UInt64	R

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Energy metering	0X2838	10296	Total reverse active energy C_T2	4	Power-off storage	Wh	UInt64	R
Energy metering	0X283C	10300	Total reverse active energy T_T2	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2840	10304	Total forward active energy A_T3	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2844	10308	Total forward active energy B_T3	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2848	10312	Total forward active energy C_T3	4	Power-off storage	Wh	UInt64	R
Energy metering	0X284C	10316	Total forward active energy	4	Power-off storage	Wh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			T_T3					
Energy metering	0X2850	10320	Total reverse active energy A_T3	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2854	10324	Total reverse active energy B_T3	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2858	10328	Total reverse active energy C_T3	4	Power-off storage	Wh	UInt64	R
Energy metering	0X285C	10332	Total reverse active energy T_T3	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2860	10336	Total forward active energy A_T4	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2864	10340	Total forward active	4	Power-off storage	Wh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			energy B_T4					
Energy metering	0X2868	10344	Total forward active energy C_T4	4	Power-off storage	Wh	UInt64	R
Energy metering	0X286C	10348	Total forward active energy T_T4	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2870	10352	Total reverse active energy A_T4	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2874	10356	Total reverse active energy B_T4	4	Power-off storage	Wh	UInt64	R
Energy metering	0X2878	10360	Total reverse active energy C_T4	4	Power-off storage	Wh	UInt64	R
Energy metering	0X287C	10364	Total reverse	4	Power-off storage	Wh	UInt64	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			active energy T_T4					
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4.2 Demand

Category	DEC address	HEX address	Name	Register length (U16)	Attribute	Unit	Data type	RW
Demand	0X3000	12288	Peak demand reset date/time	2		<Null>	Timestamp	R
Demand	0X3002	12290	Phase A active power demand	2		kW	Float32	R
Demand	0X3004	12292	Phase B active power demand	2		kW	Float32	R
Demand	0X3006	12294	Phase C active power demand	2		kW	Float32	R
Demand	0X3008	12296	Phase T active power demand	2		kW	Float32	R

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Demand	0X300A	12298	Phase A current demand	2		A	Float32	R
Demand	0X300C	12300	Phase B current demand	2		A	Float32	R
Demand	0X300E	12302	Phase C current demand	2		A	Float32	R
Demand	0X3010	12304	Phase N current demand	2		A	Float32	R
Demand	0X3012	12306	Average current demand	2		A	Float32	R
Demand	0X3014	12308	Phase A active power peak demand	2		kW	Float32	R
Demand	0X3016	12310	Phase A active power peak demand date and time	2		<Null>	Timestamp	R
Demand	0X3018	12312	Phase B active	2		kW	Float32	R

MT61GP (GR) single-phase/three-phase multifunctional smart circuit breaker

			power peak demand					
Demand	0X301A	12314	Phase B active power peak demand date and time	2		<Null>	Timestamp	R
Demand	0X301C	12316	Phase C active power peak demand	2		kW	Float32	R
Demand	0X301E	12318	Phase C active power peak demand date and time	2		<Null>	Timestamp	R
Demand	0X3020	12320	Phase T active power peak demand	2		kW	Float32	R
Demand	0X3022	12322	Phase T active	2		<Null>	Timestamp	R

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			power peak demand date and time					
Demand	0X3024	12324	Phase A current peak demand	2		A	Float32	R
Demand	0X3026	12326	Phase A current peak demand date and time	2		<Null>	Timestamp	R
Demand	0X3028	12328	Phase B current peak demand	2		A	Float32	R
Demand	0X302A	12330	Phase B current peak demand date and time	2		<Null>	Timestamp	R
Demand	0X302C	12332	Phase C current peak demand	2		A	Float32	R

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Demand	0X302E	12334	Phase C current peak demand date and time	2		<Null>	Timestamp	R
Demand	0X3030	12336	Phase N current peak demand	2		A	Float32	R
Demand	0X3032	12338	Phase N current peak demand date and time	2		<Null>	Timestamp	R
Demand	0X3034	12340	Average current peak demand	2		A	Float32	R
Demand	0X3036	12342	Average current peak demand date and time	2		<Null>	Timestamp	R

5 Register List: Reclosing and Control

5.1 Power Off and Trip

Category	Address	REG address	Data type	REG length (U16)	Attribute	RW	Name
Power off and trip	260	0X0104	UInt16	1	The default value is 1, which means enabled; 0~1; 0: off (disabled); 1: enable The modification will take effect immediately; Power-off storage;	R/W	Power-off trip enabled

5.2 Reclosing

5.2.1 Leakage Reclosing

Category	Address	REG address	Data type	REG length (U16)	Attribute	RW	Name
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Leakage reclosing	261	0X0105	UInt16	1	Default value 3; 0~14; Default: 0 off, 14 customized; The modification will take effect immediately; Power-off storage;	R/W	Leakage reclosing sequence 0...14;
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5.2.2 Current Fault Reclosing

Category	Address	REG address	Data type	REG length (U16)	Attribute	Unit	RW	Name
Current fault reclosing	329	0X0149	UInt16	1	Default value 0; 0 to 8; 0 off, 8 customized; The modification will take effect immediately; Power-off storage;	*1	R/W	Circuit breaker overload and short circuit reclosing gear

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Current fault reclosing	330	0X014A	UInt16	1	Default value 0; 0-10 times; The modification will take effect immediately; Power-off storage;	*1	R/W	User-defi ned reclosing times
Current fault reclosing	331	0X014B	UInt16	1	Default value 60; 10s-3600s; The modification will take effect immediately; Power-off storage;	S	R/W	Automatic reclosing waiting time
Current fault reclosing	332	0X014C	UInt16	1	Default value 600; 60~1800s; The modification will take effect immediately; Power-off storage;	S	R/W	The waiting time for clearing the number of reclosings

5.3 Timing Control

Category	Address	REG address	Data type	REG length (U16)	Attribute	Unit	RW	Name
Timing control	272	0X0110	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification will take effect immediately; Power-off storage;	M	R/W	Timing period settings: b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)
Timing control	273	0X0111	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid; 1: closing;	M	R/W	Timing period settings: b15-b14 time period setting: 0: time period

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					2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification will take effect immediately; Power-off storage			is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)
Timing control	274	0X0112	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification will take effect	M	R/W	Timing period settings: b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)

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					immediately; Power-off storage			
Timing control	275	0X0113	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification will take effect immediately; Power-off storage	M	R/W	Timing period settings: b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)
Timing control	276	0X0114	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid;	M	R/W	Timing period settings: b15-b14 time period setting:

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					1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification will take effect immediately; Power-off storage			0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)
Timing control	277	0X0115	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification	M	R/W	Timing period settings: b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)

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					will take effect immediately; Power-off storage			
Timing control	278	0X0116	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification will take effect immediately; Power-off storage	M	R/W	Timing period settings: b15-b14 time period setting: 0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)
Timing control	279	0X0117	UInt16	1	Default value 0; b15-b14 time period setting: 0: time period is invalid;	M	R/W	Timing period settings: b15-b14 time period setting:

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					1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day): range 00:00-24:00; The modification will take effect immediately; Power-off storage			0: time period is invalid; 1: closing; 2: opening; b13-b00 period start time (minutes starting at 0 o'clock every day)
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5.4 Main Circuit Control and Status

Category	Address	REG address	Data type	REG length (U16)	Attribute	Unit	RW	Name
Main circuit control and status	4096	0X1000	UInt16	1	01 Close, 02 Open, 03 Lock, 04 Unlock,	*1	W	Control ON/OFF;
Main circuit control and status	4097	0X1001	UInt16	1		Times.	R	0: Manual opening or power-on opening 1: 485

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								command opening 2: Fault tripping (including over-voltage, under-voltage, phase loss, over-current, and over-power) 3: Voltage loss tripping 4: Manual closing or power-on closing 5: 485 command closing 6: Automatic closing (including over / under voltage recovery closing and automatic reclosing) 7: Lock with
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								485 command (note that the switch can only be closed after unlocking with 485 command) 8: Fault lock (including over/under voltage, phase loss, over-current, over-power) 9: Security mechanism padlock or unlock (highest priority) 10: 485 command unlock 11: Timing closing 12: Timing opening 13: Leakage tripping
Main circuit	4098	0X1002	UInt16	1	Power-off	Times.	R	Total number

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control and status					storage;			of openings
Main circuit control and status	4099	0X1003	UInt16	1	Power-off storage;	Times.	R	Total number of closings
Main circuit control and status	4100	0X1004	UInt16	1	Power-off storage;	Times.	R	Number of mechanical locks
Main circuit control and status	4101	0X1005	UInt16	1	Power-off storage;	Times.	R	RS485 opening times
Main circuit control and status	4102	0X1006	UInt16	1	Power-off storage;	Times.	R	RS485 closing times
Main circuit control and status	4103	0X1007	UInt16	1	Power-off storage;	Times.	R	Command lock times
Main circuit control and status	4104	0X1008	UInt16	1	Power-off storage;	Times.	R	Number of manual openings
Main circuit control and status	4105	0X1009	UInt16	1	Power-off storage;	Times.	R	Number of manual closings
Main circuit control and status	4106	0X100A	UInt16	1	Power-off storage;	Times.	R	Number of failed openings
Main circuit control and status	4107	0X100B	UInt16	1	Power-off storage;	Times.	R	Number of failed closings

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Main circuit control and status	4108	0X100C	UInt16	1	Power-off storage;	Times.	R	Fault lock times
Main circuit control and status	4109	0X100D	UInt16	1	Power-off storage;	Times.	R	Number of scheduled openings
Main circuit control and status	4110	0X100E	UInt16	1	Power-off storage;	Times.	R	Number of scheduled closings
Main circuit control and status	4111	0X100F	UInt16	1	Power-off storage;	Times.	R	Power-off tripping times

6 Protection and Pre-alarm

6.1 Overvoltage / Undervoltage Protection, Phase Loss Protection

Category	Address	REG address	Data type	REG length (U16)	Attribute	Unit	RW	Name
Over voltage protection	287	0X011F	Float32	2	Default 275; 265~350V; Power-off storage;		R/W	Phase voltage overvoltage alarm threshold
Over voltage protection	289	0X0121	Float32	2	Default 255; Power-off storage;		R/W	Phase voltage overvoltage

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								recovery threshold
Over voltage protection	291	0X0123	UInt16	1	Default 5; Power-off storage;	S	R	Phase voltage overvoltage alarm trigger delay
Over voltage protection	292	0X0124	UInt16	1	Default 30; 20~60s; Power-off storage;	S	R/W	Phase voltage overvoltage recovery delay
Over voltage protection	293	0X0125	UInt16	1	Default 1; Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock Power-off storage;		R/W	Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock
Under voltage protection	294	0X0126	Float32	2	Default value 160; 100~190; Power-off storage;		R/W	Phase voltage undervoltage alarm threshold
Under	296	0X0128	Float32	2	Default value		R/W	Phase

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voltage protection					195; Power-off storage;			voltage undervoltage recovery threshold
Under voltage protection	298	0X012A	UInt16	1	Default value 3; Power-off storage;	S	R/W	Phase voltage undervoltage alarm trigger delay
Under voltage protection	299	0X012B	UInt16	1	Default value 30; 20~60s; Power-off storage;	S	R/W	Phase voltage undervoltage recovery delay
Under voltage protection	300	0X012C	UInt16	1	Default value 1; Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock; Power-off storage;		R/W	Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock
Phase loss protection	301	0X012D	Float32	2	Default value 20; 10~100V;		R/W	Phase voltage phase loss alarm

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					Power-off storage;			threshold
Phase loss protection	303	0X012F	Float32	2	Default value 195; Power-off storage;		R/W	Phase voltage phase loss recovery threshold
Phase loss protection	305	0X0131	UInt16	1	Default value 3; Power-off storage;	S	R/W	Phase voltage phase loss alarm trigger delay
Phase loss protection	306	0X0132	UInt16	1	Default value 30; 20~60s; Power-off storage;	S	R/W	Phase voltage phase loss recovery delay
Phase loss protection	307	0X0133	UInt16	1	Default value 1; Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock; Power-off storage;		R/W	Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock

6.2 Overcurrent Protection, Overload Protection

Category	Address	REG address	Data type	REG length (U16)	Attribute	Unit	RW	Name
Overcurrent Protection	308	0X0134	Float32	2	Default value 100; 1-250; Power-off storage;		R/W	Overcurrent alarm threshold
Overcurrent Protection	310	0X0136	Float32	2	Null		R/W	Overcurrent recovery threshold
Overcurrent Protection	312	0X0138	UInt16	1	Default value 2000; 2000-5000; Power-off storage;	ms	R/W	Overcurrent alarm trigger delay
Overcurrent Protection	313	0X0139	UInt16	1	Default value 2000; 2000-6000; Power-off storage;	ms	R/W	Overcurrent recovery delay
Overcurrent Protection	314	0X013A	UInt16	1	Default value 1; Power-off storage;		R/W	Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock
Overload Protection	315	0X013B	Float32	2	Default value 22; 1-55; Power-off storage;	kw	R/W	Overload alarm threshold
Overload Protection	317	0X013D	Float32	2	Default 30; Power-off storage;	kw	R/W	Overload recovery threshold

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Overload Protection	319	0X013F	UInt16	1	Default value 2000; 2000-5000; Power-off storage;	ms	R/W	Overload alarm trigger delay
Overload Protection	320	0X0140	UInt16	1	Default value 2000; 2000-6000; Power-off storage;	ms	R/W	Overload recovery delay
Overload Protection	321	0X0141	UInt16	1	Default value 1; There must be an alarm, and you can choose whether to associate it with the opening option; Power-off storage;		R/W	Outputs to correlate: 0 = not correlated; 1 = correlated Bit0 = Alarm Bit1 = Open Bit2 = Lock

6.3 Leakage Protection

Category	Address	REG address	Data type	REG length (U16)	Attribute	Unit	RW	Name
Leakage protection	322	0X0142	Float32	2	3=30mA; 10=100 mA; 30=300 mA; 50=500 mA;	10mA	R/W	Leakage gear

6.4 Alarm

Category	Address	REG address	Data type	REG length (U16)	RW	Name
Alarm	1280	0X0500	UInt16	1	R/W	Alarm enable bitmap 1
Alarm	1281	0X0501	UInt16	1	R/W	Alarm enable bitmap 2
Alarm	1284	0X0504	UInt16	1	R	Alarm generation bitmap 1 bit0 overvoltage phase A bit1 overvoltage phase B bit2 overvoltage phase C bit3 undervoltage phase A bit4 undervoltage phase B bit5 undervoltage phase C bit6 voltage loss phase A bit7 voltage loss phase B bit8 voltage loss phase C bit6 voltage loss phase A bit7 voltage loss phase B bit8 voltage loss phase C bit9 phase A overpower bit10 phase B overpower bit11 phase C overpower bit12 phase A overcurrent bit13 phase B overcurrent bit14 phase C overcurrent bit15 leakage
Alarm	1285	0X0505	UInt16	1	R	Alarm generation bitmap 2 bit2 phase C short circuit bit1 phase B short circuit bit0 phase A short circuit

7 Register List: Logging

7.1 Function Code (0X2D) Operation Instructions

Function code (0x2D) is used to read log records. Its request and return data formats are as follows:

7.1.1 Request Data Format

Byte No.	Data Example (Hex.)	Description	Remarks
0	01	Communication address (range from 0x01 to 0xF7, i.e. 1 to 247)	
1	2D	0x2D function code	
2	00	Log sequence number high byte	
3	01	Low byte of the log sequence number (0x01 to 0x28 for the current product, corresponding to the first 1 to the first 40 records)	
4	50	CRC check code	
5	11	CRC check code	

7.1.2 Return Data Format (Three-phase)

Data Format	Data Example (Hex)	Temporary Equivalent Register Address	Description
byte	01	<N/A>	Communication address (range from 0x01 to 0xF7, i.e. 1 to 247)
byte	2D	<N/A>	0x2D function code
byte	34	<N/A>	Return data byte number 0x38 = 56 bytes
<N/A>	BF 02 02 00	0x0000	System reserved
UnixTimeStamp_LittleEn	5A 64 24 62	0x0002	Timestamp, little endian first;

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dian			
UInt32_LittleEndian	04 00 00 00	0x0004	Fault type: Little endian first; 0: Overvoltage (Overvoltage occurs if any phase is overvoltage) 1: Undervoltage (Undervoltage occurs if any phase is undervoltage) 2: Overcurrent (Both alarms and trips will generate logs. Overcurrent occurs if any phase exceeds the set value in the register.) 3: Overpower (Both alarms and trips will be generated. Overpower occurs if any phase exceeds the set value in the register.) 4: Phase loss (Includes power-off tripping. For single-phase meters, phase loss is equivalent to power-off tripping.) 5: Tripping (Includes manual tripping, circuit breaker overload and short-circuit tripping, and intentionally pulling out the safety lock while in the closed position.) 6: Leakage trip 7: RS485 command opening; 8: Reserved; 9: RS485 command closing; 10: Automatic closing (Includes over-voltage and under-voltage recovery closing, overload reclosing, and leakage reclosing); 11: Fault lock (Overvoltage lock or undervoltage lock or phase loss lock); 12: RS485 command lock;

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			13: RS485 command unlock; 14: Safety lock (push back) unlock; 15: Timed closing; 16: Timed opening; 17: DI-controlled closing 18: DI-controlled tripping 19: Manual closing or power-on closing; Declaration: For events other than 0-6, parameters such as voltage, current, power, and leakage values will be filled with 0xFFFF; only the timestamp will be present.
UInt32_LittleEndian	2B 00 00 00	0x0006	Voltage A (unit 0.001V)
UInt32_LittleEndian	2E 00 00 00	0x0008	Voltage B (unit: 0.001V)
UInt32_LittleEndian	2D 00 00 00	0x000A	Voltage C (unit: 0.001V)
UInt32_LittleEndian	53 00 00 00	0x000C	Current A (unit 0.001A)
UInt32_LittleEndian	52 00 00 00	0x000E	Current B (unit: 0.001A)
UInt32_LittleEndian	4C 00 00 00	0x0010	Current B (unit: 0.001A)
Float32_LittleEndian	00 00 00 00	0x0012	Total active power (unit: 0.1W)
Float32_LittleEndian	00 00 00 00	0x0014	Active power A (unit: 0.1W)
Float32_LittleEndian	00 00 00 00	0x0016	Active power B (unit: 0.1W)
Float32_LittleEndian	00 00 00 00	0x0018	Active power C (unit: 0.1W)
UInt32_LittleEndian		0x001A	Leakage value (unit: mA)
<N/A>	04 1A	<N/A>	CRC check code

7.1.3 Return Data Format (Single-phase)

Data Format	Data Example (Hex)	Temporary Equivalent Register Address	Description
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byte	01	<N/A>	Communication address (range from 0x01 to 0xF7, i.e. 1 to 247)
byte	2D	<N/A>	0x2D function code
byte	34	<N/A>	Return data byte number 0x38 = 56 bytes
<N/A>	BF 02 02 00	0x0000	System reserved
UnixTimeStamp_LittleEndian	5A 64 24 62	0x0002	Timestamp, little endian first;
UInt32_LittleEndian	04 00 00 00	0x0004	Fault type: Little endian first; 0: Overvoltage (Overvoltage occurs if any phase is overvoltage) 1: Undervoltage (Undervoltage occurs if any phase is undervoltage) 2: Overcurrent (Both alarms and trips will generate logs. Overcurrent occurs if any phase exceeds the set value in the register.) 3: Overpower (Both alarms and trips will be generated. Overpower occurs if any phase exceeds the set value in the register.) 4: Phase loss (Includes power-off tripping. For single-phase meters, phase loss is equivalent to power-off tripping.) 5: Tripping (Includes manual tripping, circuit breaker overload and short-circuit tripping, and intentionally pulling out the safety lock while in the closed position.) 6: Leakage trip 7: RS485 command opening; 8: Reserved; 9: RS485 command closing;

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			10: Automatic closing (Includes over-voltage and under-voltage recovery closing, overload reclosing, and leakage reclosing); 11: Fault lock (Overvoltage lock or undervoltage lock or phase loss lock); 12: RS485 command lock; 13: RS485 command unlock; 14: Safety lock (push back) unlock; 15: Timed closing; 16: Timed opening; 17: DI-controlled closing 18: DI-controlled tripping 19: Manual closing or power-on closing; Declaration: For events other than 0-6, parameters such as voltage, current, power, and leakage values will be filled with 0xFFFF; only the timestamp will be present.
UInt32_LittleEndian	2B 00 00 00	0x0006	Voltage (unit: 0.001V)
UInt32_LittleEndian	53 00 00 00	0x0008	Current (unit: 0.001A)
Float32_LittleEndian	00 00 00 00	0x000A	Active power (unit: 0.1W)
UInt32_LittleEndian		0x000C	Leakage value (unit: mA)
<N/A>	04 1A	<N/A>	CRC check code

8 Version Revision History

Version	Description	Date	Revised by
v1.0	Firs edition	2024/9/19	wynn

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