User Manual

Version 1.0

DC System Monitor：FR-DCMG-MMPP

丰郅（上海）新能源科技有限公司
Fonrich (Shanghai) New Energy Technology Co., Ltd.

Add: 1st Floor, Building 5, No.999 Jiangyue Road, Minhang District,Shanghai
Web: www.fonrich.com
Tel: +86 21 61679671
Email: sales@fonrich.com

Table of Contents

Product description

FR-DCMG DC monitor products are mainly used in DC power transmission and distribution, such as photovoltaic combiner boxes, DC cabinets, telecommunications equipment rooms and communication base stations. Communicate with host computer or power line carrier communication via RS485. Its main function is to monitor the current of each branch in the DC system, the bus voltage, the temperature of the cabinet, the status of the lightning arrester and the status of the DC breaker. It can realize automatic alarm for abnormal conditions and real-time detection of the presence of harmful arcs in the DC circuit. Once there is a harmful arc, it will immediately send an alarm signal to directly drive the trip unit and cut off the faulty circuit, thereby effectively preventing safety risks such as fire caused by arc.

The main function

- Monitoring function: Real-time monitoring of the generation current, voltage, temperature of the combiner box, lightning arrester status, DC circuit breaker status, and DC arc fault status of each photovoltaic string in the combiner box, and communicate with the host computer through RS485.
- Display content: For the detected voltage, current, temperature, switching state, power generation and other data, the FR-DCMG-MMPP can display a histogram interface through the LCD to read the current and other data more intuitively.
- Alarm function: It can be configured to open or close the alarm and shunt release functions according to the actual needs of the site (by default, only the arc alarm and trip functions are enabled). When an alarm occurs, an alarm message will pop up on the interface.
- Current calibration: identify zero drift and improve the accuracy of current identification. (Default off)
- Trip mode switching: The default o +, o- voltage is 0v, and the voltage output is 24v when tripped. It can also be set to the opposite application.
- Power line carrier communication module: through the power line carrier expansion module DC-DCMG-PLCx, to achieve communication of up to 24 nodes
- Compatibility:Program compatible model FR-DCMG-MMPD products

Product number

Type	Model	Description
Host	FR-DCMG-MMPL	Combiner box monitoring host for 1500V and below systems, Support shunt trip，supporting power line carrier communication function (requires FR-DCMG-PLCD module). The same model supports two working modes: PLC function monitoring host node and PLC communication gateway
Communication Expansion Module	FR-DCMG-PLCD	PLC power line carrier expansion module for 1000V and below systems, needs to be used with FR-DCMG-MMPL
	FR-DCMG-PLCU	For 1500V and below systems

Documentation statement

This manual is applicable to the monitoring host whose model is FR-DCMG-MMPP and the software version is A088 or above.

Definition of terminal blocks and expansion module terminals

NC PV+ NC NC NC NC PV- NC NC NC A B S FG

fonrich FR-DCMG

R P/T

ESC   −   +   SET

DI1 SG DI2 SG DI3 SG DI4 SG TS1 SG TS2 SG 0+ 0-

FUC接口

FMB接口

FR-DCMG-PLCx
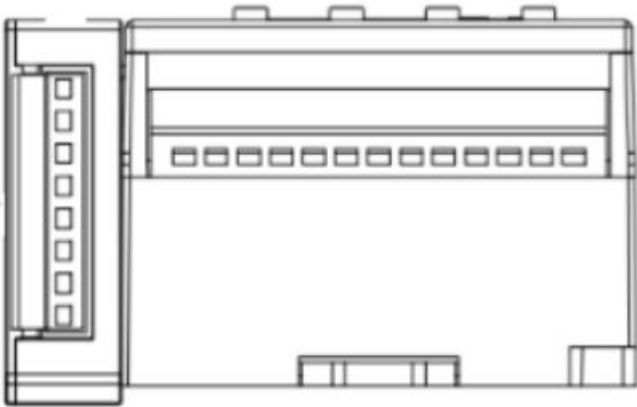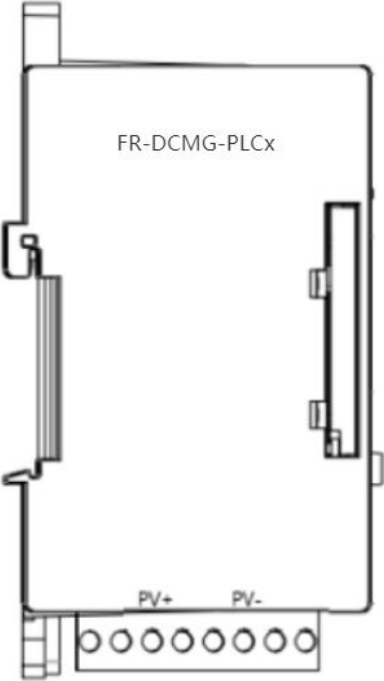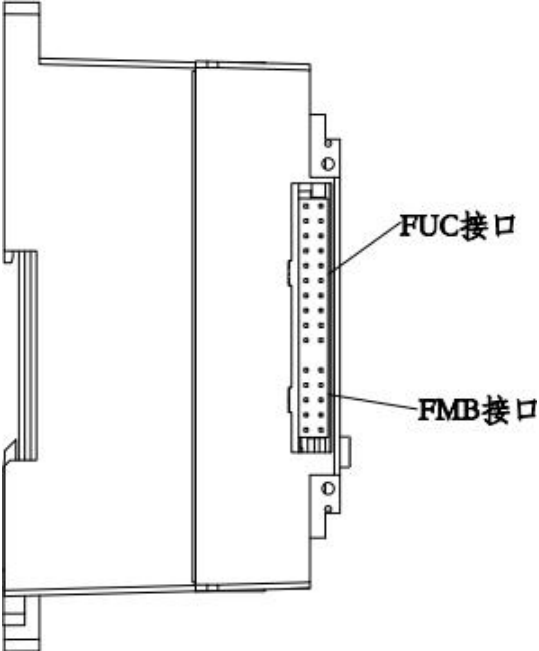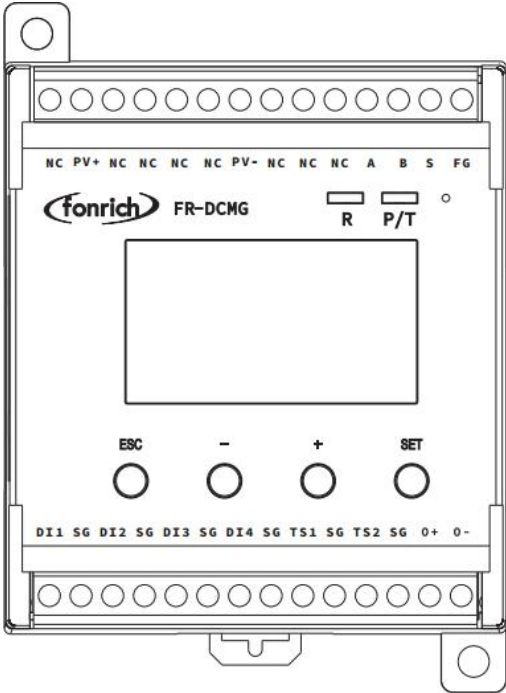
PV+   PV-

Symbol	Meaning
PV+．PV-	PV DC bus power supply terminal
NC	Not connecion
S	Not connecion
A.B	RS485 Communication terminal
FG	Fixed Ground terminal
TS1.TS2	Externally connected temperature sensor terminals

SG	Temperature sensor and digital input ground terminal
DI1.DI2.DI3.DI4	4 digital input terminals
0+.0-	Connecting the shunt release
FUC	Can connect modules with FUC interface
FMB	Modules with an FMB interface can be connected, such as the FR-DCMG-AS4A DC Arc Detector.
PLCx PV+ . PV-	PLCx expansion module DC power supply terminal

Ground connection and communication shield

The FG terminal of the FR-DCMG must be grounded, otherwise communication will interfere and the reliability of the device will decrease. The grounding wire should be grounded nearby. The grounding wire should be no more than 15cm from the "FG" terminal to the bottom of the combiner box. It is recommended to be within 10cm. The shorter the better, the thicker the better. The bottom of the combiner box should be connected to the ground. The main control unit module is fixed on a standard guide rail with a width of 3.5 cm.
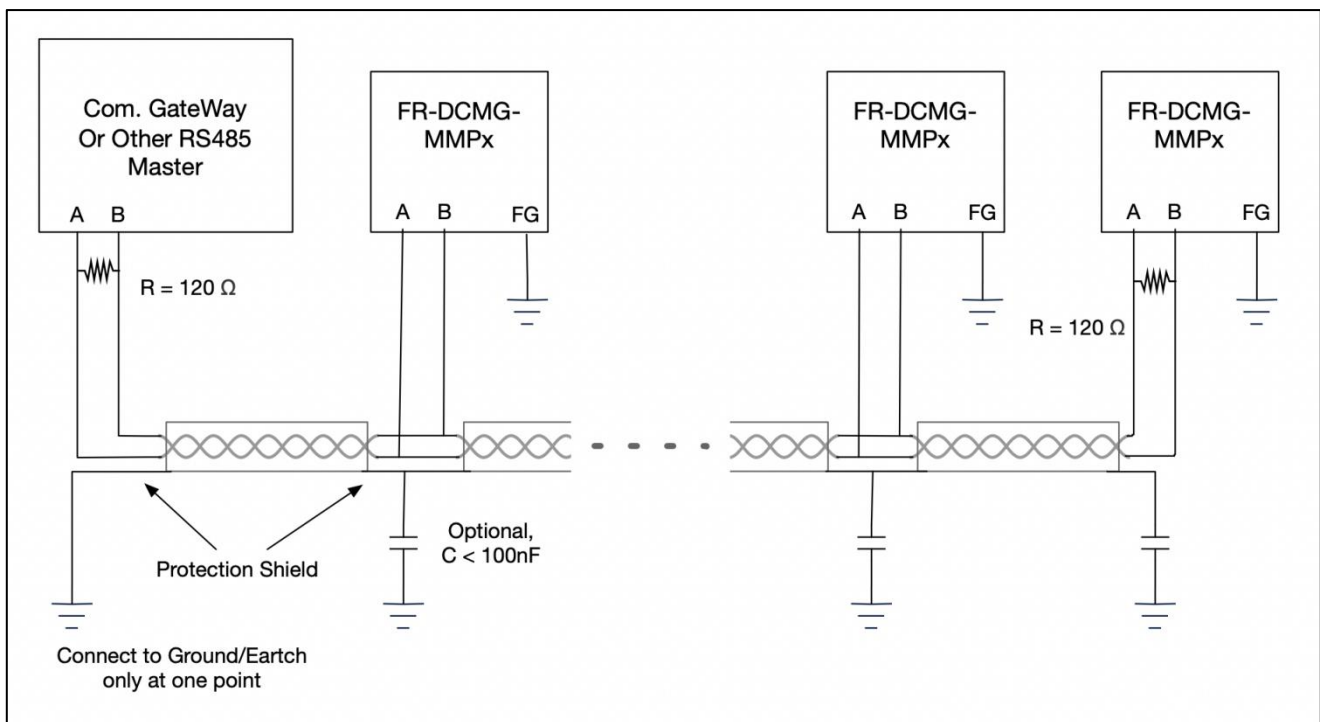
The wiring specifications of the communication shielded wire are shown in the figure above: The wiring of on-site communication lines requires that the communication shield can only be grounded at a single point, otherwise there will be a risk of lightning surge damage to all equipment on the entire communication line during a lightning strike;

If you encounter a situation where communication line interference is too large to

communicate, you can refer to the figure above, and insert a high voltage capacitor C <100nF between the shielded wire of each combiner box and the ground wire, and use this capacitor to filter the shielding layer interference.

PLC system network wiring diagram

System diagram
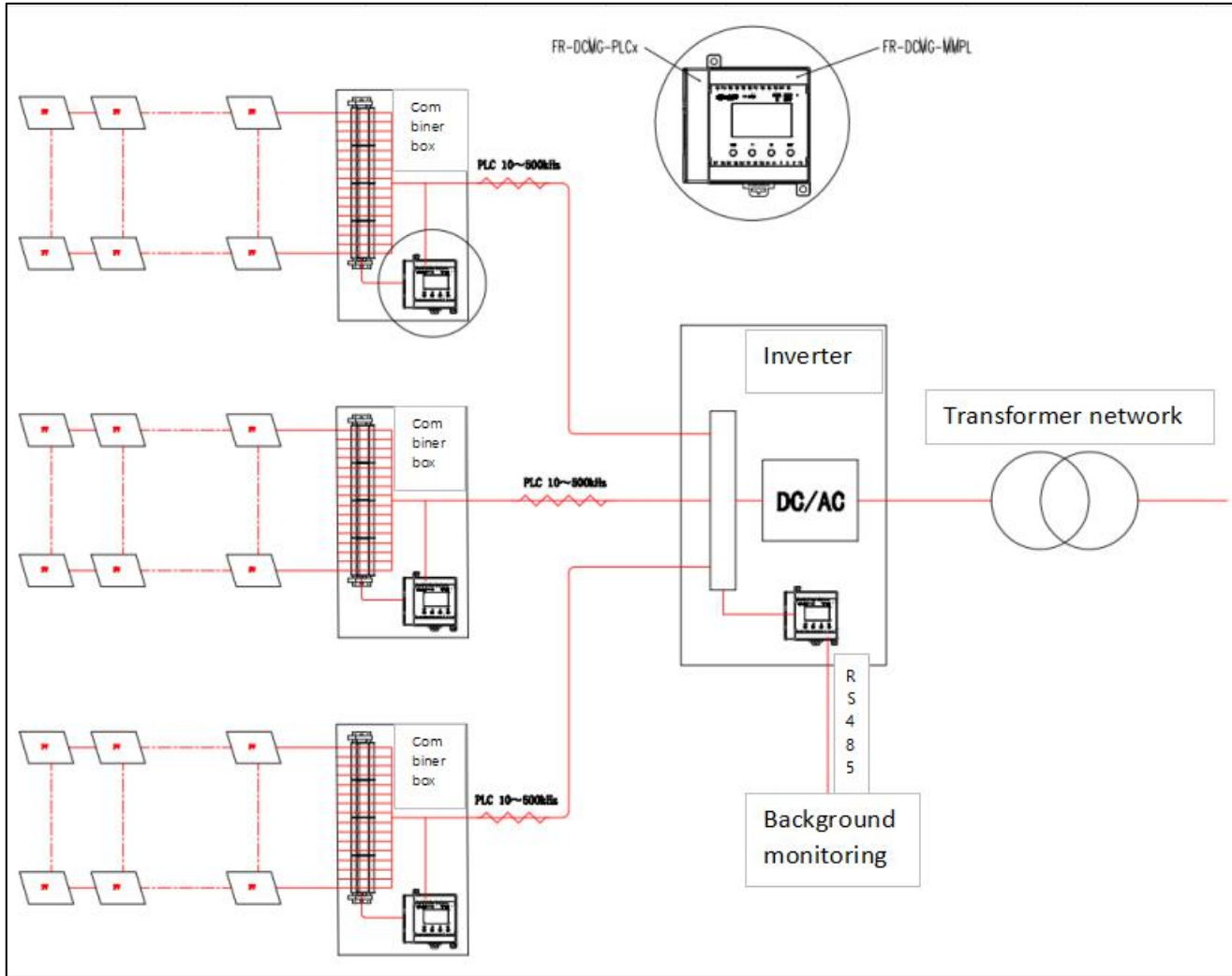
Network diagram

Networking diagram of the gateway in the inverter
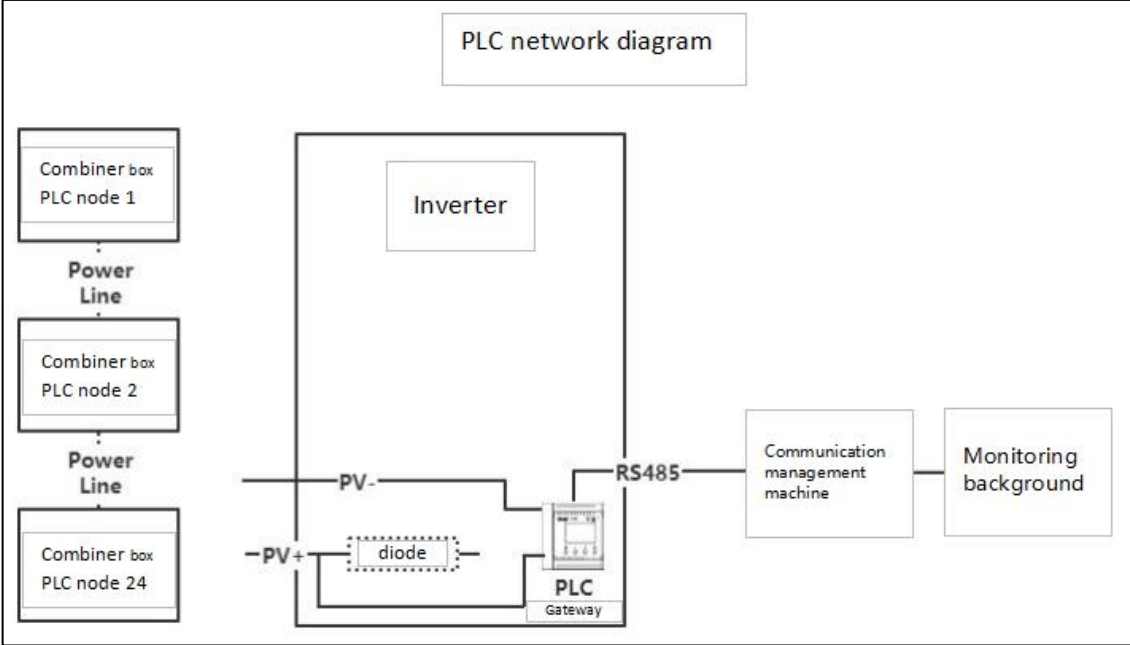
Networking diagram of the gateway in the junction box
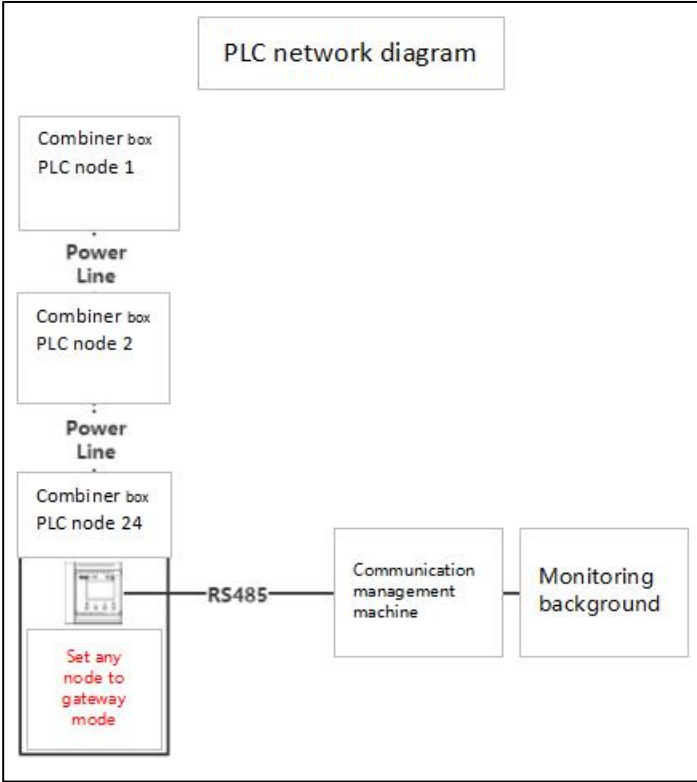
PLC wiring in combiner box and inverter
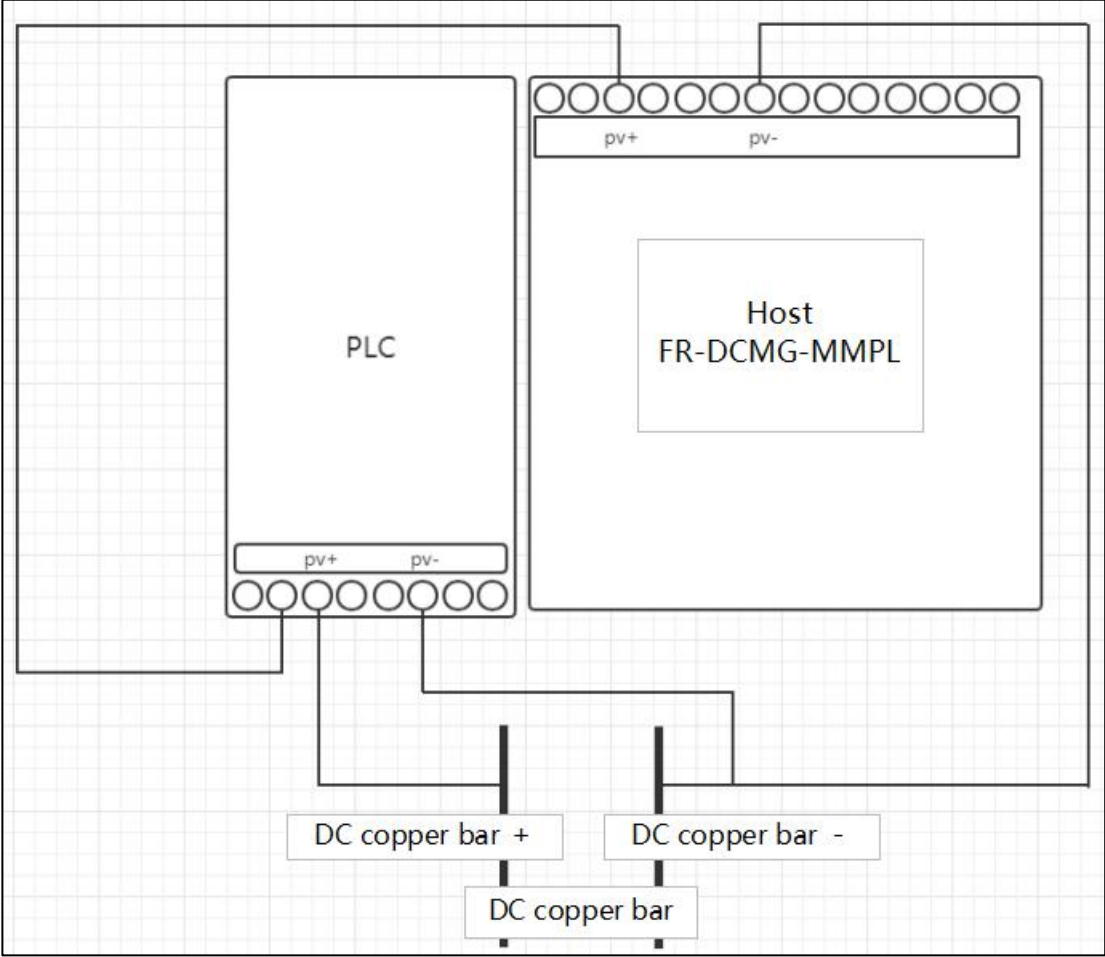
Operation interface display

Key operation

FR-DCMG-MMPP has four keys "ESC", "-", "+", and "SET".
"ESC" key is used to return to the default interface and cancel parameter setting;
"SET" key is used to enter the parameter setting mode, select the parameter to be set and complete the setting of the parameter;
The "+" and "-" keys are used to scroll the screen and adjust parameters;
Press the "+" and "-" keys at the same time to display the software version interface;
Press the "ESC" and "-" keys simultaneously to display the current calibration interface;
Press the "ESC" and "+" keys simultaneously to display the trip self-test interface;
If there is no key operation for 10 seconds, the interface will automatically jump to the default interface of the current mode, and the brightness will decrease after 5 seconds.

Initial interface display

The factory default is Modbus mode. When the host computer is connected to the device via RS485 and communicates, the LED lights "R" and "P / T" will flash alternately to indicate normal communication. When the device is not connected to communication, it restarts by default every 5 minutes, or you can turn off the default restart function, which can be turned off through the 0xF003 register.

Histogram interface

The histogram interface is the default display interface of Modbus mode, as shown below:
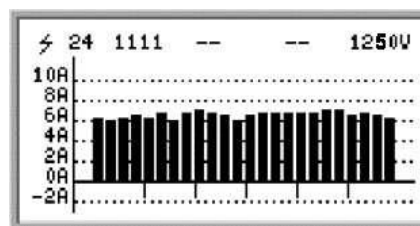
The histogram in the figure shows the current value detected by each channel. The initial interface display range is: -2A ~ 10A. You can also set register 0x0B16, which

displays -2A ~ 20A and -2A ~ 30A. Because a six-channel Hall sensor is connected, every six channels are distinguished during display, and the current channels are from 1 to 24 in order from left to right. The order of the current channels can also be set in reverse order. The lightning icon in the upper left corner indicates that the FR-DCMG-MMPP horn-connected Hall sensor with arc monitoring function; "24" indicates the current online arc and current channel number; "1111" indicates the real-time status of the digital input DI1 ~ DI4; "700V" Represents the real-time voltage value of the bus. If there is no key operation within 5 seconds, the screen brightness will decrease.

Channel current and power generation display interface

In the histogram mode, press the "+" or "-" key to enter the channel current and power generation display interface. The current value and cumulative power generation of each channel are displayed on the screen. When the "+" key is pressed first, the digital value of the current is displayed first, and when the "-" is pressed first, the digital value of the current is displayed first

```
⚡ 24  1111    --        --      1250V
CH1  :    6.929   A
CH2  :    6.798   A
CH3  :    5.929   A
CH4  :    6.619   A
```
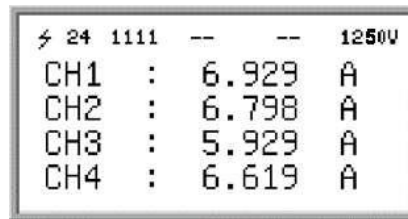
The value of cumulative power generation. When viewing the values of current and cumulative power generation, you can scroll through the screen by continuing to press the "+" or "-" key. After the current display is completed, continue to press the "+" key to start displaying the cumulative power generation. The figure above shows the current display interface. "CH1:" in the figure indicates that the current value monitored by channel 1 in real time is "6.929A", and so on.

The figure below shows the cumulative power generation display interface. "CH1:" in the figure indicates that the cumulative power generation of channel 1 is "6.929kwh", and so on.

```
⚡ 24  1111   --        ---      1250V
CH1 :  6.929    KWh
CH2 :  6.798    KWh
CH3 :  5.929    KWh
CH4 :  6.619    KWh
```
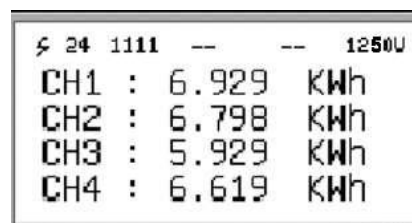
Parameter setting interface

In the histogram interface, press the "SET" key to enter the Modbus parameter setting interface. The Modbus parameter setting is as follows:

```
Device Setting
─────────────────
ADDR : 247
PAR   : None
BPS   : 9600
```

- ADDR: The communication address of the Modbus slave node, the range is 1 ~ 247 (default is 247).

- PAR: The data verification method of Modbus communication. The optional parity (None), odd parity (Odd), even parity (Even), and no parity by default.

- BPS: Baud rate for Modbus communication. The selectable baud rates are 2400, 4800, 9600 (default), 19200, 38400.

Press the "+" key to select down to the second page of the setting interface

```
Device Setting
─────────────────
MODE : Node
BAND : FCC
TEI   :   0
```

- MODE： PLC mode (Gate Gateway, Node)

- BAND： PLC frequency band (default use FCC, please consult technician for other options)

- TEI： PLC network identification (the TEI in the same network must be consistent, otherwise communication is not possible)

Press the "+" key to continue the selection down to the third page of the setting interface

```
        Device Setting
      _____
        THR  :  50
        Lang  :  EN
```

- THR：Arc alarm threshold (default: 50)

- LANG：language settings （default: EN）

Node status (Mode: Node) interface, the following figure is displayed after pressing ESC

```
        PLC  STATUS
      _____
       PLC  NODE
       SNR  :  0
                    SEND  0
```

- SNR is the signal-to-noise ratio of the current PLC line

- SEND xxx is the number of packets sent by the current node

Gateway status (Mode: Gate) interface, the following figure is displayed after pressing ESC

```
        PLC  STATUS
      _____
      │ 1  2  3  4  5  6  7  8
    1 │ 0  0  0  0  0  0  0  0
    2 │ 0  0  0  0  0  0  0  0
    3 │ 0  0  0  0  0  0  0  0
```

- The figure mainly displays the node PLC status information, the rows and columns of the table, such as

- The 5th row shows the node with the address of 5

- The first row 2 shows the node with the address 9

- The second row in the third row shows the node with the address of 18

- The current communication quality supports a maximum of 24 nodes, and the address range of these 24 nodes is 1 ~ 24

- Communication quality is represented by numbers 0-9

Parameter setting range

- Mode supports Gate / Node mode

- The address range supported by Node mode is 1 ~ 24

- The PLC address is the same as the MODBUS address

- BAND only supports FCC

- TEI can only use 0-99

Trip self-test setting interface

Press the "ESC" and "+" keys at the same time to enter the shunt trip setting interface.

Release mode (o ± DC voltage is 0v), the interface is as follows:

```
    SHTPA
 TIME :  1 s
 SELFCHECK
```

Relay mode (o ± DC voltage is 24v), the interface is as follows:

```
    SHTPA
 TIME :  180s
 SELFCHECK
```

In the shunt trip setting interface, you can set the enable time (TIME) and trip self-check (SELFCHECK) of the shunt trip during the arc alarm.

When "*" flashes in the TIME line, press the "SET" key and then press ± to modify the shunt release time.

When "*" flashes on the SELFCHECK line, press the "SET" key, and the self-check of the shunt release will be performed automatically.

The specific behavior is that when the time is reached, the shunt release operates, and after the enabling time has passed, the shunt release is restored.

Current calibration setting interface

Press the "ESC" and "-" keys at the same time to enter the current calibration setting interface, as shown below:

```
┌─────────────────────────┐
│       CALIBRATE         │
│  ─────────────────────  │
│   AUTO OFF              │
│   MUNUAL OFF           │
└─────────────────────────┘
```

To use this feature, please contact the company's technical support staff.

Software version number display interface

In the histogram interface, press the "+" and "-" keys at the same time to enter the software version number display interface, as shown below:

```
┌─────────────────────────┐
│    CBM  Information      │
│  ─────────────────────  │
│      HV ：FFFF          │
│      SV ：A088          │
│      ST ：    0         │
└─────────────────────────┘
```

- HV：Keep

- SV：Software version number

- ST：Keep

Alarm status display interface

Alarm messages can be cleared remotely and manually. Manual clearing requires long-pressing the host's "ESC" key for 2 seconds, remote clearing requires writing "1" to register 0x0079 to clear. If an arc trip alarm occurs, it must be cleared manually or remotely. Restarting the host will still display the alarm message.

Channel arc fault alarm interface

After the DC arc sensor detects the occurrence of a fault arc, the alarm information interface of the host is as shown below.

```
ALARM  TRIP
─────────────
02 — 4
   CH Arc Alarm
```
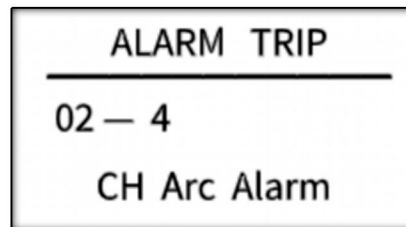
In the figure above: "02" means channel arc fault alarm, and "4" means that the fault arc alarm channel is 4.

Fault alarm clear interface

The host sends an alarm when it detects a fault, and the user can choose to handle it locally or remotely. By long-pressing the "ESC" key for about 5 seconds locally, the system jumps out of the interface as shown below, indicating that the alarm status has been cleared; remote processing needs to write "1" to 0x0079 to clear, and the interface shown below will be displayed after clearing successfully.

```
Clear Alarm ST
```
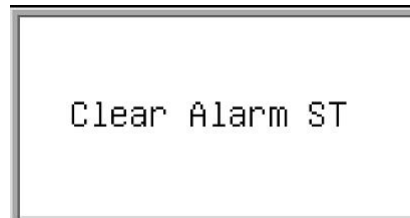
Items that can generate alarms can be set

Channel arc

Voltage is too high

Voltage is too low

Temperature is too high

Channel reverse current

Total reverse current is too high

Total current is too high

Total current is too low

Channel without current

Low channel current

High channel current

Channel current value undercurrent

Channel current value overcurrent

Lightning Arrester Status (DI1)

circuit breaker status (DI2)

Switch DI3 status

Switch DI4 status

Items that can be tripped by setting

Channel arc

Voltage is too high

Temperature is too high

Channel reverse current

Total reverse current is too high

Total current is too high

Channel without current

Low channel current

High channel current

Channel current value undercurrent

Channel current value overcurrent

Lightning Arrester Status (DI1)

Circuit breaker status (DI2)

Monitor DI3 status

Monitor DI4 status

Alarm conditions

1. Current reverse, no current, under current, over current, low current, high current, etc.

    a. Only when the average value of the channel current is greater than the set alarm threshold of the current channel, the alarm function of the above current-related items is activated; otherwise, the alarm status is forcibly cleared to 0.

    b. As for whether the alarm needs to be separately met the respective alarm conditions (above or below the respective alarm threshold).Alarm message

    c. Check if the corresponding alarm register is open, closed by default

2. Current reverse, no current, under current, over current, low current, high current, etc. Channel alarm and trip judgment preconditions:

    a. They need to meet their alarm conditions.

    b. At the same time, if the cumulative number of alarm channels is greater than the set number of trip channels, tripping will occur.

    c. Confirm whether the corresponding trip register is on or off by default.

Alarm message

- Undercurrent alarm. After the channel average current value is subtracted from the overcurrent / undercurrent alarm threshold, the current value is still less than or equal to the current channel start alarm start threshold. The overcurrent / undercurrent alarm threshold will change as the average current changes.Alarm message

- Over current alarm. After the channel average current value plus the over current / under current alarm threshold, the current value is still greater than or equal to the current channel start alarm start threshold. The over current / under current alarm

threshold will change as the average current changes.[Alarm message](#)

- Low current alarm, when the current is less than or equal to the channel current low alarm threshold, an alarm occurs.[Alarm message](#)

- High current alarm. When the current is greater than or equal to the channel current high alarm threshold, an alarm occurs.[Alarm message](#)

- No current alarm, when the absolute value of the current is less than 250mA, an alarm occurs.[Alarm message](#)

Arc Alarm Strategy

The following arc strategies are designed according to the latest arc standards of UL1699B:

1. If the arc intensity of any channel exceeds the channel alarm threshold (threshold can be set, default 70), a channel arc alarm will be generated;
2. In the trip mode (DC voltage at o ± terminal is 0v), the arc of any channel exceeds the alarm threshold, the arc alarms and trips the circuit breaker. After the trip, the alarm status of the alarm interface must be manually or remotely cleared. restore;
3. In relay mode (DC voltage at o ± terminal is 24v), the arc of any channel exceeds the alarm threshold, o ± voltage becomes 0v for 3 minutes (time can be set), and o ± voltage returns to 24v after 3 minutes; if the same Channel alarm 5 times (number of times can be set), o ± voltage is no longer restored, and it cannot be restored after power failure. You must manually or remotely clear the alarm status of the alarm interface to return to normal;
4. Accumulation method of channel arc times: The arc alarm times are only +1 if continuous arc occurs on the same channel. For example, if the first channel has 3 consecutive arc alarms, the fourth is the second channel alarm, the number of alarms is reset, and if the second channel has another alarm, the second channel alarm number is +1. After reaching 5 alarms, you must manually Clear the alarm interface.

MODBUS Protocol definition

Communication format configuration

- Modbus communication mode: RTU mode

- Address of the slave device: range form 1 to 247 (default 247)

- Baud rate (bps): 2400, 4800, 9600 (default), 19200, 38400

- Byte check mode: odd check, even check, no check (default)

Data frame format description (refer to Modbus RTU standard)

The byte in the communication frame composed by 1 start bit, 8 bits data bit, 1 parity bit, 1 stop bit like the below table (Refer to standard modbus RTU protocol):

Table 1: Data frame format table

Address Code	Function Code	Data Area	Check Zone
1byte	1byte	N*1byte	2bytes

The address code is used to identify the slave that receives the data frame and the response frame sent by that slave. The function code indicates how the master requires the slave to respond and the slave responds to that function code. Data area The content can be the address value, the number of registers, the data from the slave response and the data sent by the master to the slave, etc., which can hold up to 252 bytes of data. The check area uses CRC cyclic redundancy to check whether a frame of data is wrong. The high byte of the data frame comes first, and the low byte comes after.

Function code description

Register reads and writes in bits

- Function code 01 used to read the contents of the bit register

- Function code 02 used to reads the contents of the bit register

- Function code 05 used to write single bit-type registers

The contents represented by the register in bits are: switch value, alarm information, etc.

Register read and write in word units

- Function codes 03、04 are used to read multiple word-type registers

- Function code 06 is used to write single word-type registers

- Function code 16 is used to multiple word-type registers

The content of the word-type registers can be voltage, current, generated energy, etc

Register description

Register description in bit units (function code 02)

Bit address		Functional description	remark
Hex	Decimal		
0x0200	512	Bus arc trip state	The bus arc is faulted and a trip is performed and this bit is set. Clear the alarm and set it to 0.
0x0201	513	Channel arc trip state	The channel arc is faulted and a trip is performed and this bit is set. Clear the alarm and set it to 0.
0x0203	515	Bus voltage is too high trip state	The bus voltage is high and an trip is performed and this bit is set. Clear the alarm and set it to 0.
0x0204	516	Temperature sensor 1 over temperature and high trip state	The temperature sensor 1 overtemperature alarm and performs a tripping action, this bit is set to 1. Clear alarm after setting 0.
0x0205	517	Temperature sensor 2 over temperature and high trip state	The temperature sensor 2 overtemperature alarm and performs a tripping action, this bit is set to 1. Clear alarm after setting 0.
0x0206	518	Channel reverse current trip state	This bit is set to 1 when the channel current is reversed and the trip condition is met and a trip is performed. Clear alarm after

			setting 0.
0x0207	519	Total reverse current trip state	The total reverse current alarm and a trip action is performed and this bit is set. Clear the alarm and set it to 0.
0x0209	521	Total current is too high trip state	The total current is high and an trip is performed and this bit is set. Clear the alarm and set it to 0.
0x020A	522	Channel no current trip state	This bit is set to 1 when the channel has no current alarm and the trip condition is met and a trip is performed. Clear alarm after setting 0
0x020B	523	Channel undercurrent trip state	This bit is set to 1 when the channel undercurrent alarm is met and the trip condition is fulfilled and a trip is performed. Clear alarm after setting 0
0x020C	524	Channel overcurrent trip state	This bit is set to 1 when the channel is overcurrent and the trip condition is met and a trip is performed. Clear alarm after setting 0
0x020D	525	Channel current is too low to trip state	This bit is set to 1 when the channel current is low and the trip condition is met and a trip is performed. Clear alarm after setting 0
0x020E	526	Channel current is too high to trip state	This bit is set to 1 when the channel current is high and the trip condition is met and a trip is performed. Clear alarm after setting 0
0x0210	528	Switch 1 trip status	Switch 1 performs a trip action
0x0211	529	Switch 2 trip status	Switch 2 performs a trip action
0x0212	530	Switch 3 trip status	Switch 3 performs a trip action
0x0213	531	Switch 4 trip status	Switch 4 performs a trip action
…….	…….	………	………………
0x021E	542	Remote manual trip status	The remote manual control release performs a trip action and this bit is set to 1. Clear alarm after setting 0
0x0230	560	Bus arc alarm status	This bit is set when the bus arc strength is above the alarm threshold. Clear the alarm and set it to 0.
0x0231	561	Channel arc alarm status	This bit is set when the channel arc strength is above the alarm threshold. Clear the alarm and set it to 0.
0x0232	562	Bus voltage too low alarm	This bit is set when the bus voltage is below the alarm

		status	threshold. Cleared below the alarm release threshold
0x0233	563	Bus voltage to high alarm status	This bit is set when the bus voltage exceeds the alarm threshold. Cleared below the alarm release threshold
0x0234	564	Temperature sensor 1 high temperature alarm status	This bit is set when the temperature sensor 1 temperature exceeds the alarm threshold. Cleared below the alarm release threshold
0x0235	565	Temperature sensor 2 high temperature alarm status	This bit is set when the temperature sensor 2 temperature exceeds the alarm threshold. Cleared below the alarm release threshold
0x0236	566	Channel reverse current alarm status	When the reverse current is generated in the channel, the position is 1, and the alarm is cleared.
0x0237	567	Total reverse current alarm status	This bit is set when the total reverse current exceeds the alarm threshold. Cleared below the alarm release threshold
0x0238	568	Total current too low alarm state	This bit is set when the total current exceeds the alarm threshold. Cleared below the alarm release threshold
0x0239	569	Total current too high alarm state	This bit is set when the total current exceeds the alarm threshold. Cleared below the alarm release threshold
0x023A	570	Channel current value zero	The channel has no current alarm and this bit is set to 1.
0x023B	571	Channel current value undercurrent	Channel undercurrent alarm, this bit is set to 1
0x023C	572	Channel current value overcurrent	Channel overcurrent alarm, this bit is set to 1.
0x023D	573	Channel current value is too low	Channel current low alarm, this bit is set to 1
0x023E	574	Channel current value is too high	Channel current high alarm, this bit is set to 1
0x0240	576	Switch 1 alarm status	The state of the device's input switch DI1, 0: open, 1: closed
0x0241	577	Switch 2 alarm status	The state of the device's input switch DI2, 0: open, 1: closed
0x0242	578	Switch 3 alarm status	The state of the device's input switch DI3, 0: open, 1: closed
0x0243	579	Switch 4 alarm status	The state of the device's input switch DI4, 0: open, 1: closed
…….	……….	……………….	………………………

0x0260	608	Channel 1 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0261	609	Channel 2 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0262	610	Channel 3 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0263	611	Channel 4 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0264	612	Channel 5 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0265	613	Channel 6 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0266	614	Channel 7 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0267	615	Channel 8 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0268	616	Channel 9 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0269	617	Channel 10 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x026A	618	Channel 11 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x026B	619	Channel 12 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x026C	620	Channel 13 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to

			0
0x026D	621	Channel 14 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x026E	622	Channel 15 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x026F	623	Channel 16 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0270	624	Channel 17 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0271	625	Channel 18 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0272	626	Channel 19 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0273	627	Channel 20 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0274	628	Channel 21 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0275	629	Channel 22 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0276	630	Channel 23 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
0x0277	631	Channel 24 arc alarm status	When the arc intensity of the channel is greater than the alarm threshold, this bit is set to 1; after clearing the alarm, it is set to 0
………	………	………………	…………………
0x0280	640	Channel 1 current reverse	This bit is set when the channel current is reversed and greater

		alarm status	than the alarm threshold, otherwise cleared.
0x0281	641	Channel 2 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0282	642	Channel 3 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0283	643	Channel 4 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0284	644	Channel 5 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0285	645	Channel 6 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0286	646	Channel 7 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0287	647	Channel 8 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0288	648	Channel 9 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0289	649	Channel 10 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x028A	650	Channel 11 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x028B	651	Channel 12 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x028C	652	Channel 13 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x028D	653	Channel 14 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x028E	654	Channel 15 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x028F	655	Channel 16 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0290	656	Channel 17 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0291	657	Channel 18 current	This bit is set when the channel current is reversed and greater

		reverse alarm status	than the alarm threshold, otherwise cleared.
0x0292	658	Channel 19 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0293	659	Channel 20 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0294	660	Channel 21 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0295	661	Channel 22 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0296	662	Channel 23 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
0x0297	663	Channel 24 current reverse alarm status	This bit is set when the channel current is reversed and greater than the alarm threshold, otherwise cleared.
.....	....	....	....
0x02A0	672	Channel 1 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A1	673	Channel 2 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A2	674	Channel 3 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A3	675	Channel 4 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A4	676	Channel 5 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A5	677	Channel 6 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A6	678	Channel 7 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A7	679	Channel 8 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A8	680	Channel 9 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02A9	681	Channel 10 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.

0x02AA	682	Channel 11 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02AB	683	Channel 12 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02AC	684	Channel 13 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02AD	685	Channel 14 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02AE	686	Channel 15 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02AF	687	Channel 16 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B0	688	Channel 17 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B1	689	Channel 18 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B2	690	Channel 19 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B3	691	Channel 20 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B4	692	Channel 21 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B5	693	Channel 22 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B6	694	Channel 23 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
0x02B7	695	Channel 24 no current alarm status	This bit is set to 1 when there is no current in this channel, otherwise cleared.
……	…….	…………………	………………
0x02C0	704	Channel 1 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C1	705	Channel 2 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C2	706	Channel 3 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.

0x02C3	707	Channel 4 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C4	708	Channel 5 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C5	709	Channel 6 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C6	710	Channel 7 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C7	711	Channel 8 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C8	712	Channel 9 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02C9	713	Channel 10 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02CC	714	Channel 11 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02CB	715	Channel 12 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02CC	716	Channel 13 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02CD	717	Channel 14 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02CE	718	Channel 15 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02CF	719	Channel 16 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02D0	720	Channel 17 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02D1	721	Channel 18 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02D2	722	Channel 19 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02D3	723	Channel 20 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02D4	724	Channel 21 undercurrent	This bit is set to 1 when the channel is undercurrent, otherwise

		alarm status	cleared.
0x02D5	725	Channel 22 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02D6	726	Channel 23 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
0x02D7	727	Channel 24 undercurrent alarm status	This bit is set to 1 when the channel is undercurrent, otherwise cleared.
…….	………	………………	………………
0x02E0	736	Channel 1 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E1	737	Channel 2 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E2	738	Channel 3 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E3	739	Channel 4 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E4	740	Channel 5 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E5	741	Channel 6 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E6	742	Channel 7 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E7	743	Channel 8 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E8	744	Channel 9 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02E9	745	Channel 10 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02EA	746	Channel 11 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02EB	747	Channel 12 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02EC	748	Channel 13 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.

0x02ED	749	Channel 14 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02EE	750	Channel 15 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02EF	751	Channel 16 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F0	752	Channel 17 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F1	753	Channel 18 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F2	754	Channel 19 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F3	755	Channel 20 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F4	756	Channel 21 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F5	757	Channel 22 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F6	758	Channel 23 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
0x02F7	759	Channel 24 overcurrent alarm status	This bit is set to 1 when the channel is overcurrent, otherwise cleared.
………	………	…………………	………………………………
0x0300	768	Channel 1 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0301	769	Channel 2 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0302	770	Channel 3 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0303	771	Channel 4 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0304	772	Channel 5 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0305	773	Channel 6 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.

0x0306	774	Channel 7 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0307	775	Channel 8 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0308	776	Channel 9 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0309	777	Channel 10 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x030A	778	Channel 11 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x030B	779	Channel 12 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x030C	780	Channel 13 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x030D	781	Channel 14 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x030E	782	Channel 15 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x030F	783	Channel 16 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0310	784	Channel 17 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0311	785	Channel 18 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0312	786	Channel 19 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0313	787	Channel 20 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0314	788	Channel 21 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0315	789	Channel 22 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
0x0316	790	Channel 23 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.

0x0317	791	Channel 24 current low alarm state	This bit is set to 1 when the channel current is too low, otherwise cleared.
……….	…….	………………	………………………
0x0320	800	Channel 1 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0321	801	Channel 2 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0322	802	Channel 3 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0323	803	Channel 4 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0324	804	Channel 5 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0325	805	Channel 6 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0326	806	Channel 7 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0327	807	Channel 8 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0328	808	Channel 9 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0329	809	Channel 10 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x032A	810	Channel 11 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x032B	811	Channel 12 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x032C	812	Channel 13 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x032D	813	Channel 14 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x032E	814	Channel 15 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x032F	815	Channel 16 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.

0x0330	816	Channel 17 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0331	817	Channel 18 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0332	818	Channel 19 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0333	819	Channel 20 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0334	820	Channel 21 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0335	821	Channel 22 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0336	822	Channel 23 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.
0x0337	823	Channel 24 current too high alarm state	This bit is set to 1 when the channel current is too high, otherwise cleared.

Register description in word unit (function code 03 04 06)

Modbus address		Function description	Data Type	instruction	R/W
Hex	Decimal				
Address 0x0100 ~ 0x0158, a total of 89 consecutive addresses					
Address 0x0100 ~ 0x0123, a total of 36 consecutive addresses (data in this address supports data freeze)					
0x0100	256	Broadcast time-year, month	Unsigned short	Keep to the next broadcast, high 8 digits: year (2000+), low 8 digits: month	R
0x0101	257	Broadcast time-day, hour	Unsigned short	Keep to the next broadcast, high 8 digits: day, low 8 digits: hour	R
0x0102	258	Broadcast time-minutes, seconds	Unsigned short	Keep to the next broadcast, high 8 digits: minute, low 8 digits: second	R
0x0103	259	Retain			
0x0104	260	bus voltage	Unsigned short	Unit V, default 0	R
0x0105	261	Temperature sensor 1	short	Unit: 0.1 ° C, default -500	R
0x0106	262	Temperature sensor 2	short	Unit: 0.1 ° C, default -500	R
0x0107	263	Switch input	Unsigned short	bit0: DI1, bit1: DI2, bit2: DI3, bit3: DI4 0: open, 1: closed, default 0	R
0x0108	264	Quantity of online Hall channels	Unsigned short	Shows the quantity of Hall channels currently connected. default 0	R
0x0109	265	Total reverse current	short	Unit is 10mA, default is 0	R
0x010A	266	Total current	Short	Unit is 10mA, default is 0,	R
0x010B	267	Average current	Short	Unit mA, default 0	
0x010C ~ 0x0123	268 ~ 291	Channel 1 to 24 current	Short	Unit mA, default 0	R
Address 0x012A ~ 0x0158, a total of 45 addresses (function code 04 read, but the data is not latched)					
0x012A	298	Shunt trip status 1	Unsigned short	Bit0 bus arc, trip code is (01) Bit1 channel arc, (02) Bit3 overvoltage, (04) bit4 high temperature 1, (05) bit5 high temperature 2, (06) bit6 channel current value is reversed, (07) bit7 reverse total current is high, (08) bit9 the total current is high, (10) bit10 channel current value is zero, (11) bit11 channel current value is undercurrent, (12) bit12 channel current value is	R

34

				overcurrent, (13)	
				bit13 channel current value is low, (14)	
				bit14 channel current value is high, (15)	
0x012B	299	Shunt trip status 2	Unsigned short	Bit0 DI1，(17) bit1 DI2，(18) bit2 DI3，(19) bit3 DI4，(20) bit14：Being tripped remotely,(31) 0：No tripping，1：Already tripped, default 0	R
0x012C	300	Shunt trip status 3	Unsigned short	Bit15: Total trip status (not open) 0: no trip, 1: tripped, default 0	
0x012D	301	Alarm status 1	Unsigned short	Bit0 bus arc, bit1 channel arc, bit2 low voltage, bit3 high voltage, bit4 high temperature 1, bit5 high temperature 2, bit6 channel current value is reversed bit7 reverse total current is high, bit8 total current is low, bit9 total current is high, bit10 channel current value is zero, bit11 channel current value undercurrent bit12 channel current value overcurrent bit13 channel current value is low bit14 channel current value is high 0: No alarm, 1: Alarm, default 0	R
0x012E	302	Retain			
0x0130	304	Channel 1 ~ 16 arc alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0131	305	Channel 17 ~ 24 arc alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0132	306	The quantity of Bus arc history alarm	Unsigned short	If the current channel alarms continuously, the value will increase by 1. If there are alarms on other channels, the count will restart.	R
0x0133 ~ 0x014A	307 ~ 330	The quantity of Channel 1~24 arc history alarm	Unsigned short	default 0 This value is incremented by 1 for each channel arc alarm.	R
0x014B	331	Channel 1 ~ 16 reverse current alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x014C	332	Channel 17 ~ 24 reverse current alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R

0x014D	333	Channel 1 ~ 16 no current alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x014E	334	Channel 17 ~ 24 no current alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x014F	335	Channel 1 ~ 16 undercurrent alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0150	336	Channel 17 ~ 24 undercurrent alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0151	337	Channel 1 ~ 16 overcurrent alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0152	338	Channel 17 ~ 24 overcurrent alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0153	339	Channel 1 ~ 16 current low alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0154	340	Channel 17 ~ 24 current low alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0155	341	Channel 1 ~ 16 current high alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0156	342	Channel 17 ~ 24 current high alarm	Unsigned short	Default 0 0: No alarm, 1: Alarm	R
0x0157	343	Channel 1 ~ 16 arc channel self-check status	Unsigned short	default 0 0 means self-check passed, 1 means self-check failed	R
0x0158	344	Channel 17 ~ 24 arc channel self-check status	Unsigned short	default 0 0 means self-check passed, 1 means self-check failed	R

The address 0x0200 ~ 0x02FF, which has a total of 128 consecutive addresses. It is recommended to read in sections.

Power information (0x0200-0x024b)

0x0200	512	Total power	Unsigned short	Unit is 100W, default is 0	R
0x0201	513	Average power	Unsigned short	Unit W, default 0	R
0x0202 ~ 0x0219	514 ~ 537	Channel 1 ~ 24 power	Unsigned short	Unit W, default 0	R
0x021A	538	The higher 16bit of the total generated energy	Unsigned short	Unit Wh, default 0	R
0x021B	539	The lower 16bit of the total generated energy	Unsigned short	Unit Wh, default 0	R
0x021C	540	The higher 16bit of the generated energy of channel1	Unsigned short	Unit Wh, default 0	R
0x021D	541	The lower 16bit of the generated energy of channel1	Unsigned short	Unit Wh, default 0	R

......	......	....	......	....	......
0x024A	586	The higher 16bit of the generated energy of Channel 24	Unsigned short	Unit Wh, default 0	R
0x024B	587	The lower 16bit of the generated energy of Channel 24	Unsigned short	Unit Wh, default 0	R
Arc information (0x0250-0x0297)					
0x0250 ~ 0x0267	592 ~ 615	Channel 1~24 arc intensity real-time value	short	Unit 1, default 0	R
0x0268 ~ 0x027F	616 ~ 639	Channel 1~24 arc intensity history maximum	short	Unit 1, default 0	R
0x0280 ~ 0x0297	640 ~ 663	Channel 1 ~ 24 10 minutes arc intensity value	short	Unit 1, default 0	R
System information configuration (0x0B00-0x0B24)					
0x0B00	2816	Alarm release	Unsigned Short	The percentage of the alarm threshold is used as the alarm release threshold. Unit %, default 2, setting range 0 to 100	W/R
0x0B01	2817	Bus voltage alarm low threshold	Unsigned short	Unit V, default 300	W/R
0x0B02	2818	Bus voltage alarm high threshold	Unsigned short	Unit V, default 1000	W/R
0x0B03	2819	Temperature sensor 1 alarm high threshold	short	Unit 0.1 ° C, default 800, setting range is greater than -400	W/R
0x0B04	2820	Temperature sensor 2 alarm high threshold	short	Unit 0.1 ° C, default 800, setting range is greater than -400	W/R
0x0B05	2821	Total current low alarm threshold	Unsigned Short	Unit 10mA, default 1600, (take 16 channels to calculate)	W/R
0x0B06	2822	Total current too high alarm threshold	Unsigned Short	Unit 10mA, default 1600, (take 16 channels to calculate)	W/R
0x0B07	2823	Current channel related alarm activation threshold	Unsigned Short	Unit mA, default 2000. The average current value is greater than this value; the total current is too high, too low, the channel is undercurrent, overcurrent, no current, high current, low current, otherwise these alarms will be forcibly turned off.	W/R
0x0B08	2824	Undercurrent, overcurrent alarm threshold	Unsigned short	Unit mA, default 2000. The average current is subtracted from this value as the undercurrent alarm threshold; the average current is added to this value as	W/R

				the overcurrent alarm threshold.	
0x0B09	2825	Channel current low alarm threshold	Unsigned short	Unit mA, default 1000.	W/R
0x0B0A	2826	Channel current high alarm threshold	Unsigned short	Unit mA, default 10000.	W/R
0x0B0B	2827	Reverse total current too high threshold	short	Unit 10mA, default -600.	W/R
0x0B0C	2828	Channel reverse current too high threshold	short	Unit mA, default -2000.	W/R
0x0B0D	2839	Current channel related trip threshold	Unsigned short	Default 3. When the channel is reversed, undercurrent, overcurrent, no current, high current, and the number of channels with low current is greater than or equal to this value, the trip unit performs the tripping action. Otherwise it will not work.	W/R
0x0B0E	2830	Channel arc intensity super high alarm threshold	Short	The default is 70.Need to set according to the site conditions or customer requirements, you can call the company's technical staff	W/R
0x0B0F	2831	O + O- output level during alarm	Bool	0: low level; 1: 24V, release mode: default is 0; relay mode: default is 1	W/R
0x0B10	2832	O + O- output time during alarm	Unsigned short	Unit S (seconds), Release mode: default is 1; Relay mode: default is 180	W/R
0x0B11	2833	Automatic current calibration setting	Bool	Write 1 to enable automatic current calibration, write 0 to disable, default is 0	W/R
0x0B12	2834	Manual current calibration setting	Bool	Write 1 to start current calibration, write 0 to turn off, default is 0 Note: Make sure the channel has no current when starting calibration.	W/R
0x0B13	2835	Channel 1~16 current channel switch setting	Unsigned short	bit0：Represents the switch setting for channel 1 bit15：Represents the switch setting for channel 16 0 means disabled, 1 means enabled Default 0xFFFF	W/R
0x0B14	2836	Channel 17~24 current channel switch setting	Unsigned short	bit0：Represents the switch setting for channel 7 bit7：Represents the switch setting for channel 24 0 means disabled, 1 means enabled Default 0xFFFF	W/R
0x0B15	2837	External power management time setting	Unsigned short	Unit M (min), default 120 minutes. When the photovoltaic power supply stops, the	W/R

				host can be powered by external 24 power sources, and the power supply time can be set.	
0x0B16	2838	Current UI display, direction, reverse order control	Unsigned short	Bit0 ~ bit1: Y-axis scale setting of UI interface 0 means the UI interface displays the current up to 10A 1 means the UI interface displays the current up to 20A 2 means the UI interface displays a maximum current of 30A bit2: current channel forward / reverse sequence setting (Positive sequence: 1 ~ 24 channels arranged near the host Hall; Reverse order: Calculate from 24 to 1 channel near the host Hall) 0 means positive order; 1 means reverse order bit3: Channel current direction setting 0 means the direction is positive, 1 means the current is reversed. 0x0000 by default;	W/R
0x0B17	2839	Arc output mode setting	Unsigned short	0: release mode; 1: relay mode Default value: 0	W/R
0x0B20	2848	Alarm function management 1	Unsigned short	Bit0 Bus arc, bit1 Channel arc, bit2 Low pressure, bit3 Over pressure, bit4 High temperature 1, bit5 High temperature 2, bit6 Channel current value is reversed, bit7 Reverse total current is high, bit9 The total current is high, bit10 Channel current value is zero, bit11 Channel current value is undercurrent, bit12 Channel current value is overcurrent, bit13 The channel current value is low, bit14 The channel current value is high, 1: enable (open) alarm, 0: disable(close) alarm Default：0x0003	W/R

0x0B21	2849	Alarm function management 2	Unsigned short	Bit0 DI1 bit1 DI2 bit2 DI3 bit3 DI4 bit14: remote trip, bit15: General alarm switch, (function is forcibly turned on) 1: enable alarm, 0: disable alarm Default value: 0x800F	W/R
0x0B23	2851	Alarm trip action management 1	Unsigned short	Bit0 Bus arc, bit1 Channel arc, bit2 Low pressure, bit3 Over pressure, bit4 High temperature 1, bit5 High temperature 2, bit6 Channel current value is reversed, bit7 Reverse total current is high, bit9 The total current is high, bit10 Channel current value is zero, bit11 Channel current value is undercurrent, bit12 Channel current value is overcurrent, bit13 The channel current value is low, bit14 The channel current value is high, 1: enable (open) the trip, 0: disable (close) trip Default：0x0003	W/R
0x0B24	2852	Alarm trip action management 2	Unsigned short	Bit0 DI1, bit1 DI2, bit2 DI3, bit3 DI4 bit14: remote trip, bit15 Alarm trip master switch, (function is forcibly turned on) 1: Enable (open) trip, 0: Disable (close) trip Default: 0x8000	W/R
System information configuration 2 (0x0C00-0x0C06)					W/R
0x0C00	3072	Clear power generation history value record	Unsigned short	Write 1 reset energy history record, read always 0	W/R
0x0C01	3073	Clear channel arc and bus arc history alarms	Unsigned short	Write 1 reset channel arc and bus arc history alarm times record, read always 0	W/R
0x0C02	3074	Clear alarm trip status	Unsigned	Write 1 reset trip alarm status	W/R

		information and alarm interface	short	information and alarm interface, read always 0.(remove interface and status information related to trip management)	
0x0C03	3075	Retain			
0x0C04	3076	Remote manual control release performs tripping	Unsigned short	Write 1 to control the trip of the trip. read always 0	W/R
0x0C05	3077	Arc channel self-check operation	Unsigned short	Write 1 to start the arc channel self-check, 1S to end the self-check. read always 0	W/R
0x0C06	3078	Retain			

Time information configuration (0x0C90-0x0C92)

0x0C90	3216	Broadcast time - year, month	Unsigned short	Keep to the next broadcast, high 8 digits: year (2000+), low 8 digits: month	R
0x0C91	3217	Broadcast time - day, hour	Unsigned short	Keep to the next broadcast, high 8 digits: day, low 8 digits: hour	R
0x0C92	3218	Broadcast time - minutes, seconds	Unsigned short	Keep to the next broadcast, high 8 digits: minute, low 8 digits: second	R
0x0C93	3219	Retain			

System settings (0xFE00-0xFE54)

0xFE00	65024	Modbus address	Unsigned short	Set range 1 ~ 247, default 247. Set other values to restore the default values.	W/R
0xFE01	65025	Modbus Baud rate	Unsigned short	1：2400，2：4800，3：9600，4：19200，5：38400 Default is 3, setting other values to restore the default	W/R
0xFE02	65026	Modbus Parity	Unsigned short	0: NONE, 1: ODD, 2: EVEN Default is 0, setting other values to restore the default	W/R
0xFE03	65027	Retain			W/R
0xFE04	65028	Retain			W/R
0xFE05	65029	Retain			W/R
0xFE06	65030	System UI display settings	Unsigned short	Lower 8 bits: system language setting 0: Chinese; 1: English, default value 1 High eight bits: system logo settings Reserved, default 0	W/R
0xFE0B		Retain			W/R
0xFE0C	65292	MUC reset system time	Unsigned short	Write 0x1234 to reset the MCU (the host will restart) (not open) read: High 8 bits, system time-year High 8 bits, system time-month	W/R
0xFE0D	65293	EEPROM initialization 1	Unsigned	Write 0x5555, (not open)	W/R

			short	Operating EEPROM initialization 1 and 2 at the same time and resetting the MCU will restore the factory settings Read: 0	
0xFE0E	65294	EEPROM initialization 2	Unsigned short	Write 0xAAAA, (not open) Operating EEPROM initialization 1 and 2 at the same time and resetting the MCU will restore the factory settings Read: 0	W/R
0xFE0F	65039	Retain			
0xFE10	65040	Retain			
0xFE11	65041	主机各模块状态信息	Unsigned short	bit0: MCU is ready bit1: Modbus slave is ready bit2: Modbus master is ready bit3: FMB communication is ready bit4: FRB communication is ready bit5: RTM communication is ready bit6: FUD communication ready (PVP) bit7: FUD communication ready (ACS) bit8: MVS board initialization is complete bit9: SMART file system is ready bit10: RTC is ready 1: ready System information (not open)	R
0xFE12	65042	CMB board software version number	Unsigned short	System information (not open)	R
0xFE13	65043	CMB board hardware version number	Unsigned short	System information (not open)	W/R
0xFE14	65044	CMB board hardware serial number	Unsigned short	System information (not open)	W/R
0xFE15	65045	FCT version number	Unsigned short	System information (not open)	W/R
0xFE16	65046	FCT date	Unsigned short	System information (not open)	W/R
0xFE17	65047	PVP board software version number	Unsigned short	System information (not open)	R
0xFE18	65048	PVP board hardware version number	Unsigned short	System information (not open)	R
0xFE19	65049	PVP board hardware serial number	Unsigned short	System information (not open)	R
0xFE1A	65050	Modbus master time_ms	Unsigned short	System information (not open)	R
0xFE1B	65051	Almtrip time_ms	Unsigned short	System information (not open)	R

0xFE1C	65052	Power and kwh time_ms	Unsigned short	System information (not open)	R
0xFE1D	65053	Modbus Master bps modify status	Unsigned short	1: indicates that the Modbus Slave baud rate of 9600 is changed to 19200. 2: Modification of Modbus Slave baud rate 9600 to 19200 3: Indicates that the Modbus Slave baud rate of 9600 is changed to 19200. Failed to execute. The Modbus Slave baud rate is changed to 9600. 4: indicates that the execution of the Modbus Slave baud rate to 9600 is successful 5: Modification of Modbus Slave baud rate 9600 to 19200 failed. The system will use 9600bps for Modbus data exchange 6: It means that the system has performed a baud rate modification action before. Now the Modbus Slave connection status cannot be monitored. The system automatically adjusts the baud rate to 9600. The system default Modbus Master baud rate is 9600bps. Only after monitoring the battery board information, it attempts to adjust the baud rate.	R
0xFE1F	65055	modbus status	Unsigned short	not open	
0xFE20	65056	Screen test File system	Unsigned short	Write 1 black screen, write 2 white screen, write 3 to restore the default display, (Not open) Read: The total number of alarm messages stored in the file system.	W/R
0xFE21	65057	Four key states	Unsigned short	bit0 indicates ESC key status bit1 indicates SUB status bit2 indicates ADD status bit3 indicates SET status Default 0xF (not open)	R
0xFE22	65058	LED, etc. and backlight	Unsigned short	Bit0 indicates the status of LED1 bit1 indicates the status of LED2 bit3 indicates backlight status Default 2, must be written to 0 to restore	W/R

				the default state (not open)	
0xFE23	65059	Retain			W/R
0xFE24	65060	Arc Self Test 2	Unsigned short	Write 1 to open read self-test 2 result permission. After obtaining the self-test result, you must write 0 to end. Reading is always 0. (Not open)	W/R
0xFE25	65061	Arc channel 1 self test 2 results	Unsigned short	(Not open)	R
....	....		....	....	
0xFE3C	65084	Arc channel 24 self test 2 results	Unsigned short	(Not open)	R
0xFE3D-0xFE54	65085 ~ 65108	Calibration results for current channels 1-24	Unsigned short	(Not open)	R

PLC register:

Function code 03

Modbus address		Function description	instruction
Hex	Decimal		
0x3000	12290	Read current TEI	0-99
0x3001	12290	Read the number of packets currently sent	
0x3002	12290	Read the current working mode	1: gateway mode, 0: node mode
0x3003	12291	Read the number of nodes online	The value range is 0 ~ 16, the current number of online nodes
0x3004	12292	Read the tonemap (high 16 bits) at the time of transmission	The tonemap is 3 bytes in size and requires two register descriptions
0x3005	12293	Read the tonemap (lower 16 bits) when sending	
0x3006	12294	Read test results for production testing	
0x3007	12295	Read current band	0: CEN-A 1: CEN-B 3: FCC
0x3008	12296	Read receive SNR for production test	Not open
0x3009	12297	Reads whether it is currently in test mode	0: Normal mode 1: Test mode is not open
Reserved	...	...	...
0x3010	12304	Node1's tonemap (high 16 bits)	The tonemap is 3 bytes in size and requires two register descriptions
0x3011	12305	Node1's tonemap (low 16 bits)	
0x3012	12306	Node2's tonemap (high 16 bits)	
0x3013	12307	Node2's tonemap (low 16 bits)	
0x3014	12308	Node3's tonemap (high 16	

		bits)	
0x3015	12309	Node3's tonemap (low 16 bits)	
0x3016	12310	Node4's tonemap (high 16 bits)	
0x3017	12311	Node4's tonemap (low 16 bits)	
0x3018	12312	Node5's tonemap (high 16 bits)	
0x3019	12313	Node5's tonemap (low 16 bits)	
0x301A	12314	Node6's tonemap (high 16 bits)	
0x301B	12315	Node6's tonemap (low 16 bits)	
0x301C	12316	Node7's tonemap (high 16 bits)	
0x301D	12317	Node7's tonemap (low 16 bits)	
0x301E	12318	Node8's tonemap (high 16 bits)	
0x301F	12319	Node8's tonemap (low 16 bits)	
0x3020	12320	Node9's tonemap (high 16 bits)	
0x3021	12321	Node9's tonemap (low 16 bits)	
0x3022	12322	Node10's tonemap (high 16 bits)	
0x3023	12323	Node10's tonemap (low 16 bits)	
0x3024	12324	Node11's tonemap (high 16 bits)	
0x3025	12325	Node11's tonemap (low 16 bits)	
0x3026	12326	Node12's tonemap (high 16 bits)	
0x3027	12327	Node12's tonemap (low 16 bits)	
0x3028	12328	Node13's tonemap (high 16 bits)	
0x3029	12329	Node13's tonemap (low 16 bits)	

0x302A	12330	Node14's tonemap (high 16 bits)	
0x302B	12331	Node14's tonemap (low 16 bits)	
0x302C	12332	Node15's tonemap (high 16 bits)	
0x302D	12333	Node15's tonemap (low 16 bits)	
0x302E	12334	Node16's tonemap (high 16 bits)	
0x302F	12335	Node16's tonemap (low 16 bits)	
	...	...	
0x3040	12352	Node24's tonemap (high 16 bits)	
0x3041	12353	Node24's tonemap (low 16 bits)	
Reserved	...	...	...
0x3050	12368	Communication quality of node 1	Range 0--9,9 means the best communication quality
0x3051	12369	Communication quality of node 2	Range 0--9,9 means the best communication quality
0x3052	12370	Communication quality of node 3	Range 0--9,9 means the best communication quality
0x3053	12371	Communication quality of node 4	Range 0--9,9 means the best communication quality
0x3054	12372	Communication quality of node 5	Range 0--9,9 means the best communication quality
0x3055	12373	Communication quality of node 6	Range 0--9,9 means the best communication quality
0x3056	12374	Communication quality of node 7	Range 0--9,9 means the best communication quality
0x3057	12375	Communication quality of node 8	Range 0--9,9 means the best communication quality
0x3058	12376	Communication quality of node 9	Range 0--9,9 means the best communication quality
0x3059	12377	Communication quality of	Range 0--9,9 means the best communication quality

		node 10	
0x305A	12378	Communication quality of node 11	Range 0--9,9 means the best communication quality
0x305B	12379	Communication quality of node 12	Range 0--9,9 means the best communication quality
0x305C	12380	Communication quality of node 13	Range 0--9,9 means the best communication quality
0x305D	12381	Communication quality of node 14	Range 0--9,9 means the best communication quality
0x305E	12382	Communication quality of node 15	Range 0--9,9 means the best communication quality
0x305F	12383	Communication quality of node 16	Range 0--9,9 means the best communication quality
	...	...	...
0x3067	12391	Communication quality of node 24	Range 0--9,9 means the best communication quality
Reserved	...	...	...
0x3068	12392	Connection quality of node 1	The range is 0--255, the larger the value, the better the connection quality
0x3069	12393	Connection quality of node 2	The range is 0--255, the larger the value, the better the connection quality
0x306A	12394	Connection quality of node 3	The range is 0--255, the larger the value, the better the connection quality
0x306B	12395	Connection quality of node 4	The range is 0--255, the larger the value, the better the connection quality
0x306C	12396	Connection quality of node 5	The range is 0--255, the larger the value, the better the connection quality
0x306D	12397	Connection quality of node 6	The range is 0--255, the larger the value, the better the connection quality
0x306E	12398	Connection quality of node 7	The range is 0--255, the larger the value, the better the connection quality
0x306F	12399	Connection quality of node 8	The range is 0--255, the larger the value, the better the connection quality
0x3070	12400	Connection quality of node 9	The range is 0--255, the larger the value, the better the connection quality
0x3071	12401	Connection quality of node 10	The range is 0--255, the larger the value, the better the connection quality

0x3072	12402	Connection quality of node 11	The range is 0--255, the larger the value, the better the connection quality
0x3073	12403	Connection quality of node 12	The range is 0--255, the larger the value, the better the connection quality
0x3074	12404	Connection quality of node 13	The range is 0--255, the larger the value, the better the connection quality
0x3075	12405	Connection quality of node 14	The range is 0--255, the larger the value, the better the connection quality
0x3076	12406	Connection quality of node 15	The range is 0--255, the larger the value, the better the connection quality
0x3077	12407	Connection quality of node 16	The range is 0--255, the larger the value, the better the connection quality
	...	...	...
0x307F	12415	Connection quality of node 24	The range is 0--255, the larger the value, the better the connection quality
Reserved	...	...	...
0x3080	12416	Number of packets received from node 1	
0x3081	12417	Number of packets received from node 2	
0x3082	12418	Number of packets received from node 3	
0x3083	12419	Number of packets received from node 4	
0x3084	12420	Number of packets received from node 5	
0x3085	12421	Number of packets received from node 6	
0x3086	12422	Number of packets received from node 7	
0x3087	12423	Number of packets received from node 8	
0x3088	12424	Number of packets received from node 9	
0x3089	12425	Number of packets received from node 10	
0x308A	12426	Number of packets received	

		from node 11	
0x308B	12427	Number of packets received from node 12	
0x308C	12428	Number of packets received from node 13	
0x308D	12429	Number of packets received from node 14	
0x308E	12430	Number of packets received from node 15	
0x308F	12431	Number of packets received from node 16	
	…	…	…
0x3097	12439	Number of packets received from node 24	
Reserved	…	…	…
0x4000 ~ 0x4050	16384 ~ 16464	Read node 1 data	
Reserved	…	…	…
0x4100 ~ 0x4150	16640 ~ 16720	Read node 2 data	
Reserved	…	…	…
0x4200 ~ 0x4250	16896 ~ 16976	Read node 3 data	
Reserved	…	…	…
0x4300 ~ 0x4350	17152 ~ 17232	Read node 4 data	
Reserved	…	…	…
0x4400 ~ 0x4450	17408 ~ 17488	Read node 5 data	
Reserved	…	…	…
0x4500 ~	17664 ~	Read node 6 data	

0x4550	17744		
Reserved	...	...	...
0x4600 ~ 0x4650	17920 ~ 18000	Read node 7 data	
Reserved	...	...	...
0x4700 ~ 0x4750	18176 ~ 18256	Read node 8 data	
Reserved	...	...	...
0x4800 ~ 0x4850	18432 ~ 18512	Read node 9 data	
Reserved	...	...	...
0x4900 ~ 0x4950	18688 ~ 18768	Read node 10 data	
Reserved	...	...	...
0x4A00 ~ 0x4A50	18944 ~ 19024	Read node 11 data	
Reserved	...	...	...
0x4B00 ~ 0x4B50	19200 ~ 19280	Read node 12 data	
Reserved	...	...	...
0x4C00 ~ 0x4C50	19456 ~ 19536	Read node 13 data	
Reserved	...	...	...
0x4D00 ~ 0x4D50	19712 ~ 19792	Read node 14 data	
Reserved	...	...	...
0x4E00 ~ 0x4E50	19968 ~ 20048	Read node 15 data	

Reserved	...	...	...
0x4F00 ~ 0x4F50	20224 ~ 20304	Read node 16 data	
Reserved	...	...	...
0x5000 ~ 0x5050	20580 ~ 20560	Read node 17 data	
Reserved	...	...	...
0x5100 ~ 0x5150	20736 ~ 20816	Read node 18 data	
Reserved	...	...	...
0x5200 ~ 0x5250	20992 ~ 21072	Read node 19 data	
Reserved	...	...	...
0x5300 ~ 0x5350	21284 ~ 21328	Read node 20 data	
Reserved	...	...	...
0x5400 ~ 0x5450	21504 ~ 21584	Read node 21 data	
Reserved	...	...	...
0x5500 ~ 0x5550	21760 ~ 21840	Read node 22 data	
Reserved	...	...	...
0x5600 ~ 0x5650	22016 ~ 22096	Read node 23 data	
Reserved	...	...	...
0x5700 ~ 0x5750	22272 ~ 22352	Read node 24 data	
Reserved	...	...	...

Function code 06

Modbus address		Function description	instruction
Hex	Decimal		
0x3000	12288	Setting up TEI	0-99
0x3002	12290	Set working mode	Low byte is valid, 1: gateway mode, 0: node mode, others are invalid
0x3003	12291	Set up BAND	0: CEN-A 1: CEN_B 3: FCC
0x3004	12292	Write tonemap (high 16 bits)	The tonemap is 3 bytes in size and requires two register descriptions PLC setting interface When BAND is CEN_A, the range of tonemap values can be set to 0--0x3F (inclusive) When BAND is FCC, set the range of tonemap value to 0--0xFFFFFF (inclusive)
0x3005	12293	Write tonemap (low 16 bits)	
0x3006	12294	Send test data once	Used for production test, this register is not 0, send test data once
0x3007	12295	Set test mode	0: Normal mode, 1: Test mode, resume normal mode after power on again

The data of PLC node 1 is as follows, the data of other nodes are similar:

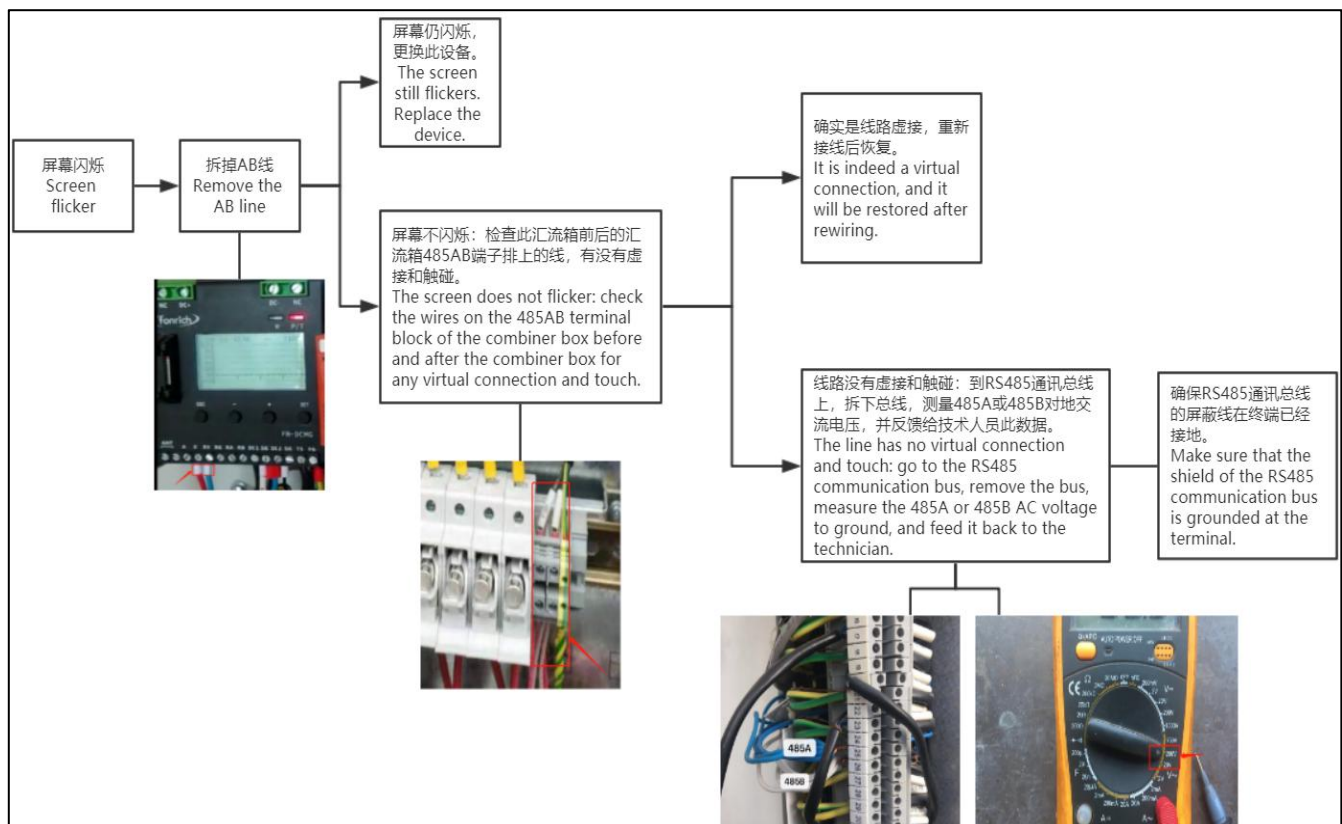| Modbus address		Function description	Data Type	instruction
Hex	Decimal			
0x4000	16384	bus voltage	Unsigned Short	Unit V, default 0
0x4001	16385	Temperature sensor 1	Short	Unit: 0.1 ° C, default -500
0x4002	16386	Temperature sensor 2	Short	Unit: 0.1 ° C, default -500
0x4003	16387	Switch input	Unsigned Short	bit0: DI1, bit1: DI2, bit2: DI3, bit3: DI4 0: open, 1: closed, default 0
0x4004	16388	Quantity of online Hall channels	Unsigned Short	Shows the quantity of Hall channels currently connected. default 0
0x4005	16389	The high 16bit of the total generated energy	Unsigned Short	
0x4006	16390	The low 16bit of the total generated energy	Unsigned Short	
0x4007	16391	Total reverse current	Short	Unit is 10mA, default is 0
0x4008	16392	Total current	Short	Unit is 10mA, default is 0
0x4009	16393	Average current	Short	Unit mA, default 0
0x400a ~ 0x4029	16394 ~ 16425	Channel 1 to 24 current	Short	Unit mA, default 0
0x402a	16426	Shunt trip status 1	Unsigned Short	Bit0 bus arc, trip code is 01 bit1 channel arc, 02 bit2 reserved, 03 (not open) Bit3 overvoltage, 04 bit4 high temperature 1,05 bit5 high temperature 2,06 bit6 channel current value reverse, 07 bit7 total reverse current is high, 08 bit8 reserved, 09 (not open) bit9 total current is high, 10

				bit10 channel current value is zero, 11
				bit11 channel current value undercurrent, 12
				bit12 channel current value overcurrent, 13
				bit13 channel current value is low, 14
				bit14 channel current value is high, 15
				bit15 reserved, 16
				0: no trip, 1: tripped, default 0
0x402b	16427	Shunt trip status 2	Unsigned Short	Bit0 DI1, 17
				bit1 DI2, 18
				bit2 DI3, 19
				bit3 DI4, 20
				bit14: Remote trip, 31
				0: no trip, 1: tripped, default 0
0x402c	16428	Shunt trip status 3	Unsigned Short	Bit15: Total trip status (not open)
				0: no trip, 1: tripped, default 0
0x402d	16429	Alarm status 1	Unsigned Short	Bit0 bus arc,
				bit1 channel arc,
				bit2 low voltage,
				bit3 high voltage,
				bit4 high temperature 1,
				bit5 high temperature 2,
				bit6 channel current value reverse
				bit7 total reverse current is high,
				bit8 total current is low,
				bit9 total current is high,
				bit10 channel current value is zero,
				bit11 channel current value undercurrent
				bit12 channel current value overcurrent
				bit13 channel current value is low
				bit14 channel current value is high
				0: no alarm, 1: alarm, default 0
0x402e	16430	Alarm status 2	Unsigned Short	bit0: DI1
				bit1: DI2
				bit2: DI3
				bit3: DI4
				0: no alarm, 1: alarm, default 0
0x402f	16431	Alarm status 3	Unsigned Short	bit15: Total alarm status (not open)
				For alarm status 3 extension
0x4030	16432	Channel 1 ~ 16 arc alarm	Unsigned Short	Default 0
				0: No alarm, 1: Alarm
0x4031	16433	Channel 17 ~ 24 arc	Unsigned	Default 0

		alarm	Short	0: No alarm, 1: Alarm
0x4032	16434	The quantity of Bus arc history alarm	Unsigned Short	If the current channel alarms continuously, the value will increase by 1. If there are alarms on other channels, the count will restart.
0x4033 ~ 0x404a	16435 ~ 16458	The quantity of Channel 1~24 arc history alarm	Unsigned Short	This value is incremented by 1 for each channel arc alarm. default 0

Appendix

FAQ

Troubleshooting for screen flicker (Please refer to page 3 of the manual to deal with the problem of excessive interference from shielded wires)

Document revision record

Revision	Time	Description
1.0	2020-03-12	For A088 and above products Update switch description, terminal definition, new setting interface and alarm interface; Add ——Arc Intensity 10 Minute Value Register ——Arc Alarm Strategy —— Trip mode high-low level switching function, interface and register ——Communication shielded wire wiring specification ——Current calibration function, interface and register ——FAQ (screen flicker troubleshooting method) ——PLC System diagram ——Parameter setting range Deletion-Broadcast, battery board and other registers

Contact us

If you have any questions about this product, please contact us. Please remember the following contact information:

Fonrich (Shanghai) New Energy Technology Co., Ltd.

Add: 1st Floor, Building 5, No.999 Jiangyue Road, Minhang District,Shanghai

Zip code: 201114 Tel :+86 21 61679672

Fax:+86 21 60717306 Email：sales@fonrich.com
Website: www.fonrich.com