453

ARCM300-DU 型

智慧用电集中显示单元

ARCM300-DU Type

Smart Power Concentration Display Unit

安装使用说明书 V1.0

Installation and Use Manual V1.0

江苏安科瑞电器制造有限公司

Jiangsu Acrel Electrical Manufacturing Co., LTD.

申　　明

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目录 Content

1. 概述 Overview

智慧用电集中显示单元（简称集中显示单元）是针对 0.4kV 以下的 TT、TN 系统设计的监控设备，具有点阵式 LCD 显示、单回路剩余电流监测、四路温度监测、两路继电器输出、两路开关量输入、一路 RS485 通讯、一路二总线通讯，能与用电现场的各种一体式电气火灾监控装置进行通信连接和数据的采集与转发，实现对各种用电现场电气火灾隐患的实时监控和实时反馈。

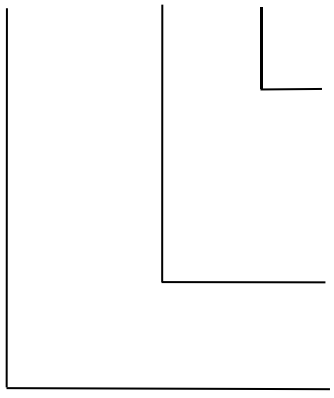
The intelligent power centralized display unit is a monitoring device designed for TT and TN systems below 0.4kV. It has dot-matrix LCD display, single-circuit residual current monitoring, four-way temperature monitoring, two-way relay output, two-way switch input, one way RS485 communication and one way two bus communication. It can communicate with various integrated electrical fire monitoring devices, fault arc detectors and other equipment on the electricity site, and collect and forward data, so as to realize real-time monitoring and real-time feedback of electrical fire hazards on various electricity sites.

产品采用先进的微控制器技术，集成度高，体积小巧，安装方便，集智能化，数字化，网络化于一身， 是建筑监控装置预防监控、系统绝缘老化预估等的理想选择。同时将原有 RS485 通讯升级为 GPRS 无线通讯方式，解决了现场布线难的问题。作为一种先进的智能化、数字化的采集元件，该智能装置已广泛应用于各种控制系统。

The product adopts advanced microcontroller technology, high integration, small size, easy installation, intelligent, digital, and networked. At the same time, the original RS485 communication is upgraded to GPRS wireless communication, which solves the problem of difficult on-site wiring. As an advanced intelligent and digital acquisition element, the intelligent device has been widely used in various control systems.

2. 产品型号 Product model

ARCM300 - DU - □



无线通讯：	4G	4G 通讯功能
Wireless Communication:	4G	4G communication function
	空	无 4G 通讯功能
	Null	No 4G communication function
型号说明：	DU 集中显示单元	
Product Type:	DU centralized display unit	
产品种类号：	智慧用电集中显示单元	
Model Description:	Smart Power Concentration Display Unit	

表 1　型号规格表

Table 1 Product model function description

型号 Model	功能说明 Functional specification
ARCM300-DU	支持单回路剩余电流监测、四路温度监测、一路 RS485 通讯、一路二总线通讯 Support single loop residual current monitoring、Four-channel temperature monitoring、One RS485 communication、One two-bus communication.
ARCM300-DU-4G	支持单回路剩余电流监测、四路温度监测、一路 RS485 通讯、一路二总线通讯，具有 4G 通讯功能 Support single loop residual current monitoring、Four-channel temperature monitoring、One RS485 communication、One two-bus communication,with 4G communication function.

3. 技术参数

表 2　集中显示单元技术参数

Table 2　Concentration Display Unit technical parameters

型号 Model		ARCM300-DU
功能 Function		参数 parameter
辅助电源 Auxiliary power	额定电压 Rated voltage	AC220V
	功耗 Power consumption	正常监视状态≤5VA Normal monitoring state≤5VA
监控报警 Monitoring alarm	剩余电流 Residual current	报警设定值：300~1000mA 连续可调 Alarm setting value: 300~1000mA continuously adjustable
	温度 Temperature	报警设定值：45~140℃连续可调，步长 1℃ Alarm setting value: 45~140° C continuously adjustable, step size 1° C
动作延时时间 Action delay time		报警时间设定值：0.1~60S连续可调 Alarm time setting value: 0.1~60S continuously adjustable
测量精度 Measurement accuracy		剩余电流 精度 1 级 Residual current Class 1
开关量输入 Switch input		两路无源干接点输入方式:内置电源 Two-way passive dry contact input mode: built-in power supply
开关量输出 Switch output		两路无源常开触点，触点容量 AC 220V/1A ，DC 30V/1A Two-way passive normally open contacts, contact capacity AC 220V/1A, DC 30V/1A
通讯 Communication		上行：485 通讯，Modbus-RTU 协议 Upstream:485 communication; Modbus-RTU protocol
		下行：二总线通讯，可连接 32 个探测器 Downlink:Two bus communication:, 32 detectors can be connected
事件记录 Record		20 条故障、报警和开关记录 20 fault, alarm and switch records
网络模式 Network mode		GPRS 通讯（4G） GPRS communication (4G)

4. 安装与接线 Installation and Wiring

4.1.外形尺寸（单位 mm） Dimensions (unit: mm)

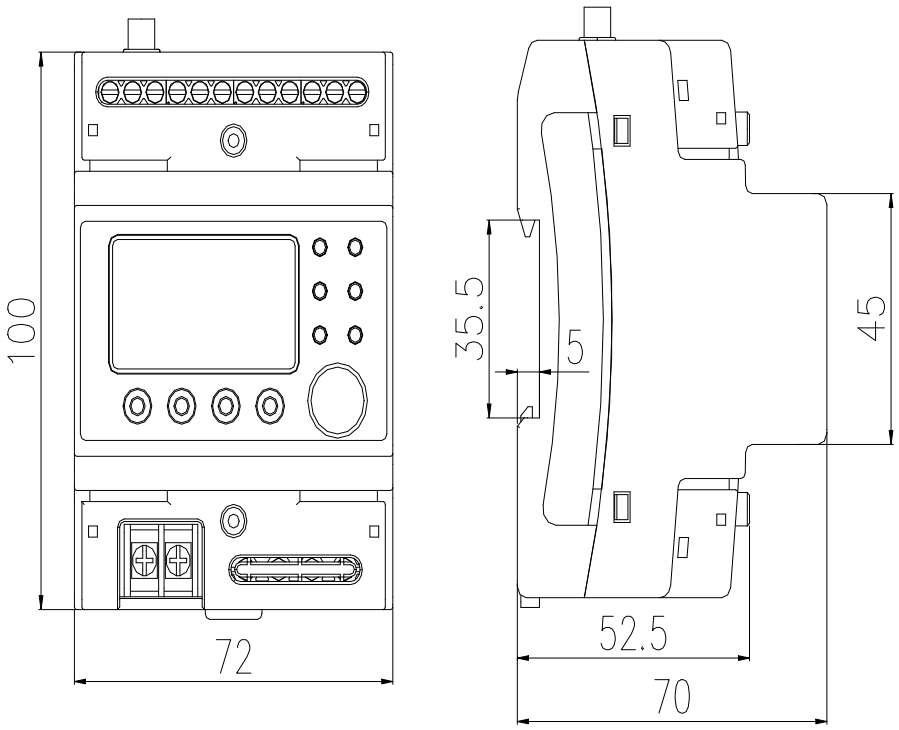


图 1　外形尺寸图

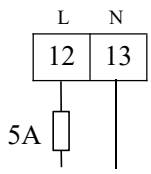
Figure 1 Dimensions

4.2.安装方式　Installation method

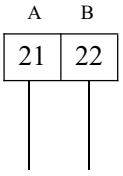
35mm 导轨安装、壁挂安装。

35mm rail installation,wall installation.

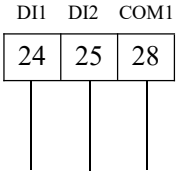
4.3.接线说明 Wiring instruction



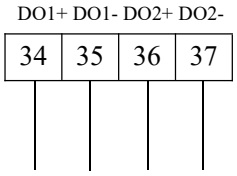
辅助电源
Auxiliary Power



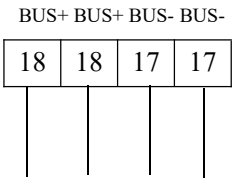
485 通讯
485 Communication



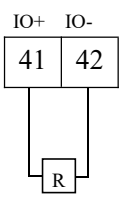
开关量输入
Switch Input



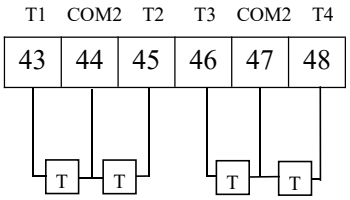
继电器输出
Relay Output



二总线通讯
Two Bus Communication



漏电输入
Leakage Input



温度输入
Temperature Input

4.4. 系统组网图

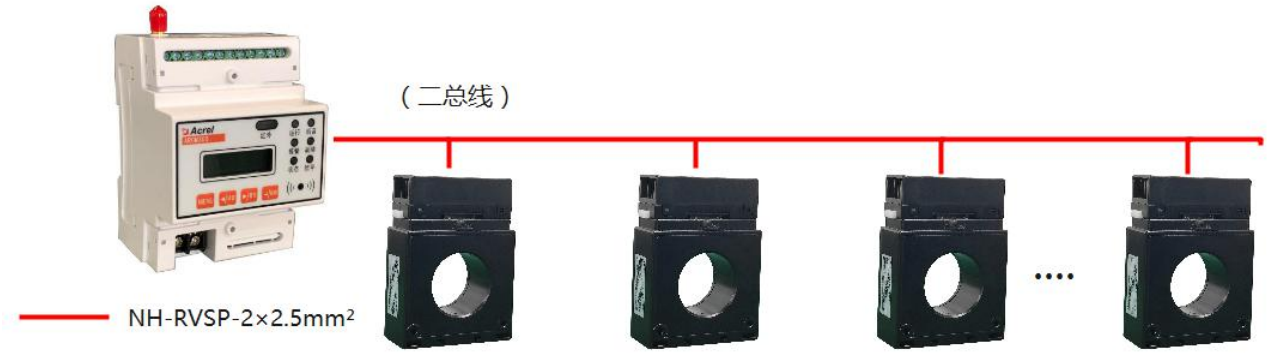


图 2　系统组网图

Figure 2 System Networking

5.　使用操作指南 Instruction manual

5.1. 测量项目说明 Description of measurement item

可监测二总线下的一体式电气火灾监控探测器的报警情况并作出报警指令，当从机发出报警时，集中显示单元发出声光报警；可同时监控剩余电流和温度，并根据剩余电流和温度的大小做出报警指令，当输入信号达到报警设置时，发出声光报警。

It can monitor the alarm situation of the integrated electrical fire monitoring device make an alarm command. When the slave sends an alarm, the centralized display unit sends out an audible and visual alarm. It can monitor the residual current and temperature at the same time, and make an alarm command according to the size of the residual current and temperature. When the input signal reaches the alarm setting, an audible and visual alarm is issued.

5.2. 面板介绍 Front-panel introducing

面板布置如图 3 所示：

Front-panel shown in Figure 3:

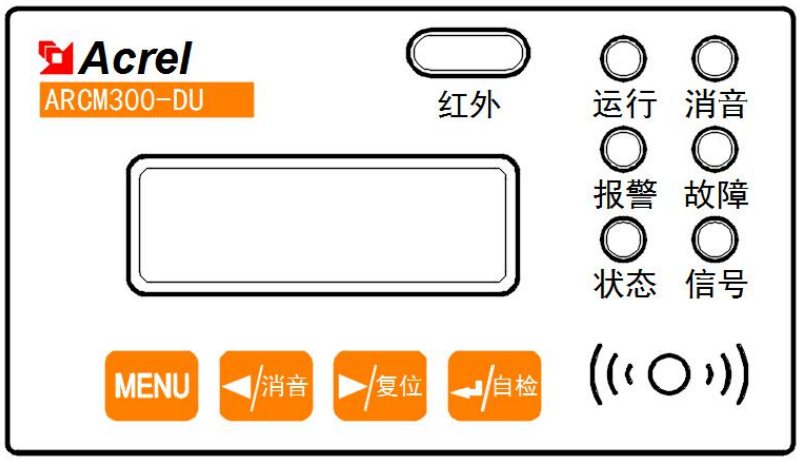


图 3 面板示意图

Figure 3 Front-panel Schematic

指示灯状态定义如下：

Definition of indicator lights:

● 运行指示灯（绿色）：仪表处于正常运行状态：通讯未连接时，指示灯闪烁，闪烁频率大约为 1 秒一次；通讯正常连接，只接收到通讯数据时，指示灯闪烁频率大约为 2 秒一次；通讯正常连接，接收并发送数据时，指示灯快闪烁四次灭一次；

● Operation indicator light (green): The meter is in normal operation: When the communication is not connected, the indicator light flashes, and the flashing frequency is about once every second. When the communication is connected normally, and only the communication data is received, the flashing frequency of the indicator light is about once every 2 seconds. When the communication is connected normally, and the data is received and sent, the indicator light flashes four times and turns off once.

● 消音指示灯（绿色）：仪表处于消音状态时，指示灯常亮；

● Silencer indicator light (green): When the meter is in the mute state, the indicator light is always on.

● 报警指示灯（红色）：仪表处于报警状态时，指示灯常亮；

● Alarm indicator light (red): When the meter is in an alarm state, the indicator light is always on.

● 故障指示灯（黄色）：仪表处于故障时，故障指示灯常亮(故障为外部线路故障，而不是仪表本身的故障)；

● Fault indicator light (yellow): When the meter is in fault, the fault indicator light is always on (the fault is the fault of the external circuit, not the fault of the meter itself).

● 状态指示灯（绿色）：连接到服务器，指示灯常亮；未连接到服务器，指示灯熄灭；

● Status indicator light (green): When the meter is connected to the server, the indicator light is always on. When the meter is not connected to the server, the indicator light is off.

● 信号指示灯（红色）：GPRS 模块工作正常，指示灯闪烁。

● Signal indicator light (red): The GPRS module works normally, and the indicator light flashes.

5.3.按键操作 Button operation

可通过按键对仪表进行地址、参数设置，亦可通过按键来对仪表执行消音、自检和复位操作等。集中显示单元在线监控装置共有 4 个按键，从左至右分别为：MENU 菜单键、◄ /消音左键、►/复位右键和↵/自检回车键。

You can set the address and parameters of the meter by pressing the buttons, and you can also perform silencing, self-checking and reset operations on the meter by pressing the buttons. The centralized display unit online monitoring device has a total of 4 buttons, from left to right: MENU Button, ◄ /Mute Left Button, ►/Reset Right Button and ↵/Self-check Enter Button.

MENU 菜单键 MENU Button	非编程模式下：按该键进入编程模式，装置提示输入密码，或返回上一级菜单； 编程模式下：用于返回上一级菜单，或退出编程模式。 In non-programming mode: press this button to enter programming mode, the device prompts to enter a password, or returns to the previous menu; In programming mode: it is used to return to the previous menu, or exit the programming mode.

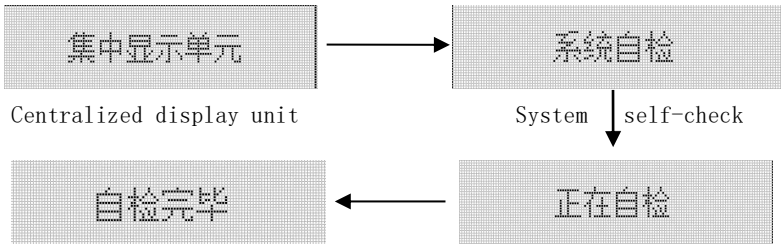
◀左键、▶右键 ◀Left Button、 ▶Right Button	非编程模式下：用于切换显示界面；长按左键，实现消音功能； 长按右键，实现复位功能。 编程模式下：用于同级菜单的切换和光标的移位。 In non-programming mode: it is used to switch the display interface; long press the left button to realize the mute function; long press the right button to realize the reset function. In programming mode: it is used to switch the same level menu and shift the cursor.
↵ 回车键 ↵ Enter Button	非编程模式下：长按回车键,实现自检功能； 编程模式下：用于菜单项目的选择确认，及进入下一级菜单。 In non-programming mode: long press the Enter button to realize the self-checking function; In programming mode: it is used to confirm the selection of menu items and enter the next level menu.

5.4.液晶显示 LCD Display

5.4.1. 开机与自检 Power-on and self-check

将集中显示单元上电，集中显示单元进行自检，界面显示如下图所示，所有指示灯同时变亮，所有指示灯依次熄灭，蜂鸣器响，最终运行指示灯闪烁。集中显示单元监控装置进入正常监控状态。

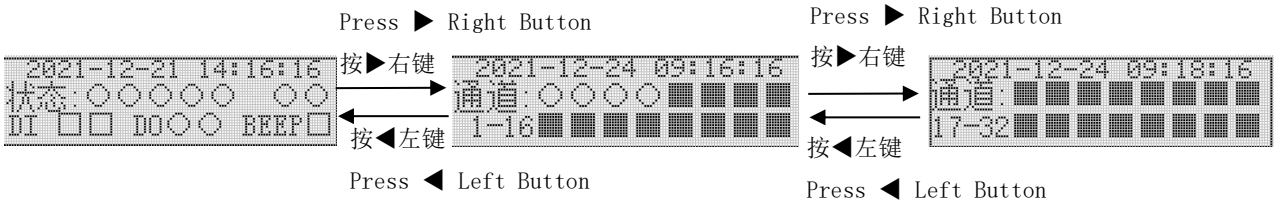
The centralized display unit is powered on and performs self-check. The interface is displayed as shown in the figure below. All the indicator lights turn on at the same time, then turn off in sequence. The buzzer sounds and the operation indicator light flashes in the end. Then the centralized display unit monitoring device enters the normal monitoring state.



5.4.2. 主、从模块状态页面 Master and Slave Module Status Pages

自检完毕进入主模块状态界面，通过▶键切换到下行模块状态界面。

After completing the self-check, it will enter the master module status interface, and switch to the downlink module status interface by pressing ▶ button.



（1）主模块状态 （2）下行 1-16 回路状态 （3）下行 17-32 回路状态

(1) Master module status (2) Downlink 1-16 loop status (3) Downlink 17-32 loop status

注：主模块各状态符号定义表：

Note:The definition table of each status symbol of the main module:

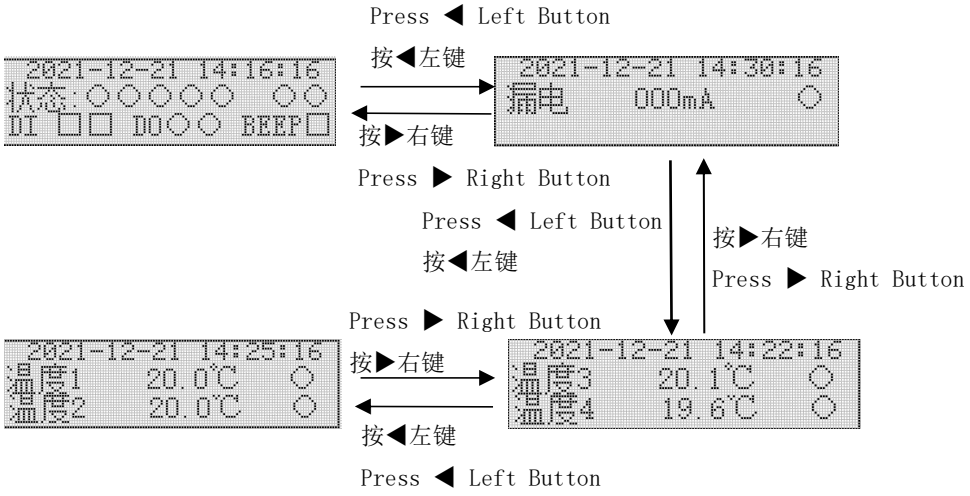
状态 1-5 Status 1-5 注释：1-主模块漏电状态 2-5-主模块温度状态 Note: 1-Master module leakage status 2-5-Master module temperature status	○	●	◐	◑
	正常 Normal	报警 Alarm	断线 Disconnection	短路 Short Circuit

状态 6-7 Status 6-7 注释：6-下行回路故障状态 7-下行回路报警状态 Note: 6- Downlink fault status 7- Downlink alarm status	○		□	●
	正常 Normal		故障 Fault	报警 Alarm
DI1-2 注释：左-DI1 状态 右-DI2 状态 Note: Left-DI1 Status Right-DI2 Status	□		■	
	打开 Open		闭合 Closed	
DO1-2 注释：左-DO1 状态 右-DO2 状态 Note: Left-DO1 Status Right-DO2 Status	○		●	
	打开 Open		闭合 Closed	
BEEP	□		■	
	打开 Open		闭合 Closed	
通道 1-32 Channels 1-32	○	●	□	■
	正常 Normal	报警 Alarm	故障 Fault	关闭 Closed

5.4.3. 实时数据界面 Real-time data interface

在主模块状态下，通过 ◀ 左键和 ▶ 右键切换页面，查看主模块的漏电及温度实时数据。

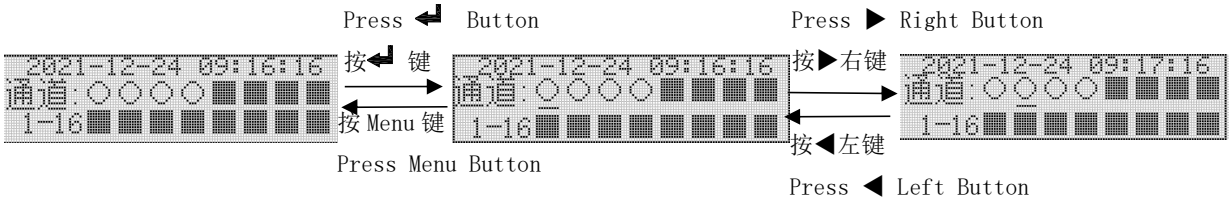
In the state of the master module, you can view the real-time data of leakage current and temperature of the master module by switching the page with the ◀ left button and ▶ right button.



5.4.4. 从模块数据查看与参数设置 Viewing and parameter setting from module data

在下行模块状态页面，通过↵ 键进入通道选择页面，用◀ 左键和 ▶ 右键切换所选择的通道。

On the downlink module status page, you can use the ↵ button to enter the channel selection page, and use the ◀ left button and ▶ right button to switch the selected channel.



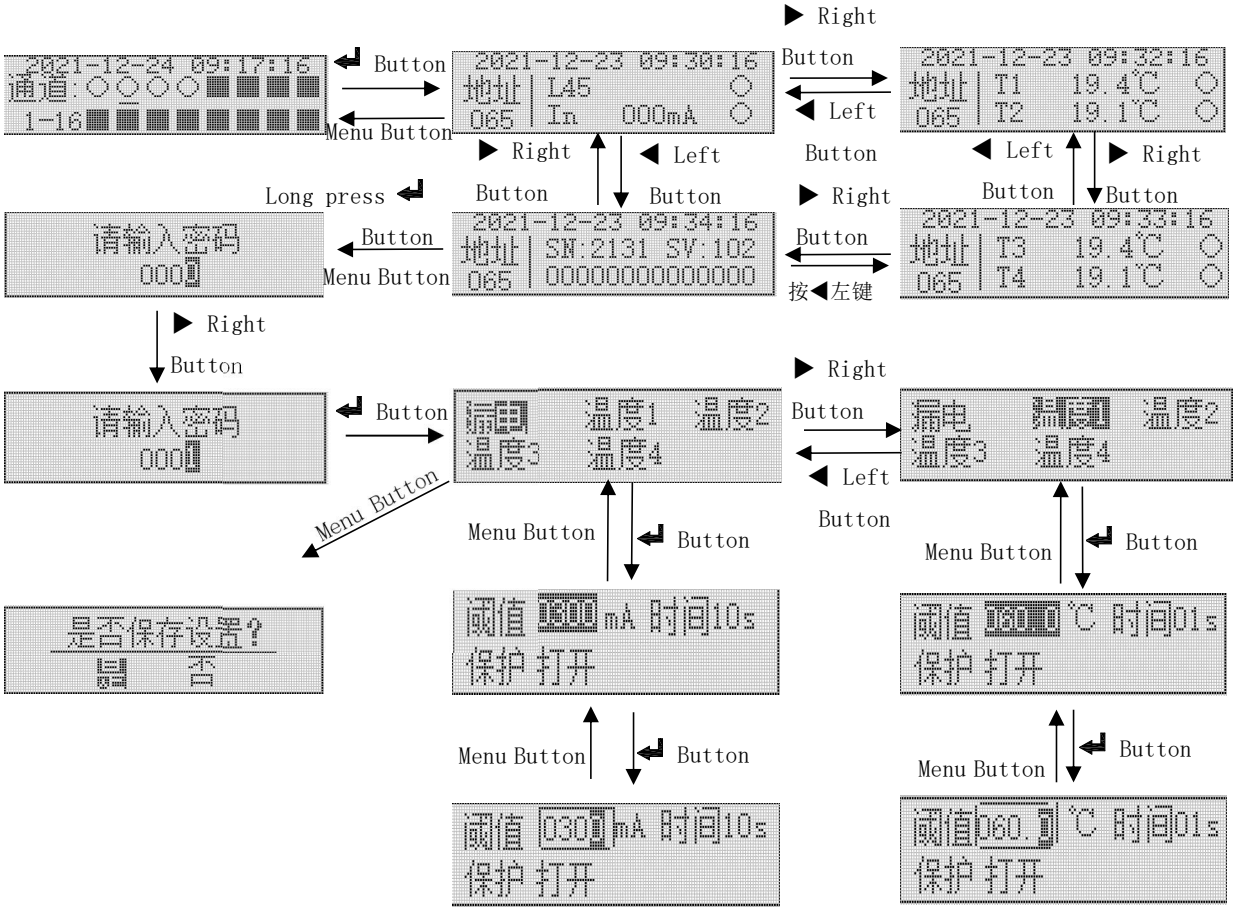
5.4.4.1. 电气火灾从模块数据查看与参数设置

Electrical fire slave module data viewing and parameter setting

当选择的通道连接的是一体式电气火灾探测器时,按↵ 回车键可进入查看此模块的具体信息，包括探测器报警状态、剩余电流、温度、软件编号 SN、软件版本号 SV 以及唯一码 14 位。

When the selected channel is connected to an integrated electrical fire detector, you can press ↵ button to enter and view the specific information of this module, including detector alarm status,

residual current, temperature, software number SN, software version number SV and 14-bit unique code.



注 Note:

1）初始密码均为 0001

1) The initial password is 0001

2）通过◀ 左键和 ▶右键更改阈值、时间以及保护设置，并按↵ 键确认。

2) Use ◀ left button and ▶ right button to change the threshold, time and protection settings, and press button to confirm.

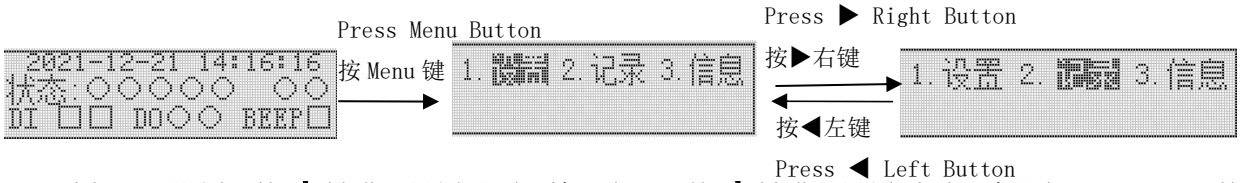
3）在“是否保存设置”界面通过按◀ 、▶键来进行保存数据选择，按回车键确认并退出设置界面。

3) In the "Save setting" interface, you can press◀ 、▶ to choose whether to save the data, then press button to confirm and exit the settings interface.

5.4.5. 设置界面 Setting interface

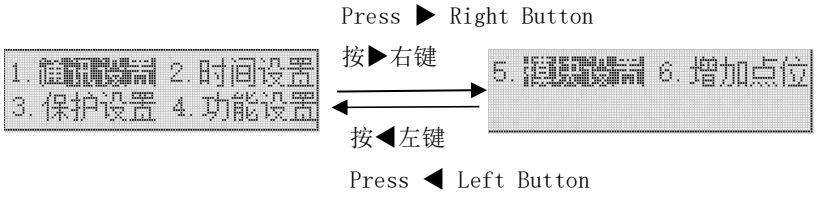
在通道状态显示界面下，按 MENU 菜单键进入菜单界面，按◀ 、▶键选择设置、记录、信息。

In the channel status display interface, press MENU button to enter the menu interface, and press ◀ 、▶ buttons to select setting, record, and information.



选择“1.设置”按↵ 键进入设置界面，输入密码，按↵ 键进入设置页面（默认密码：0001），按◀ 、▶ 键进行选择。

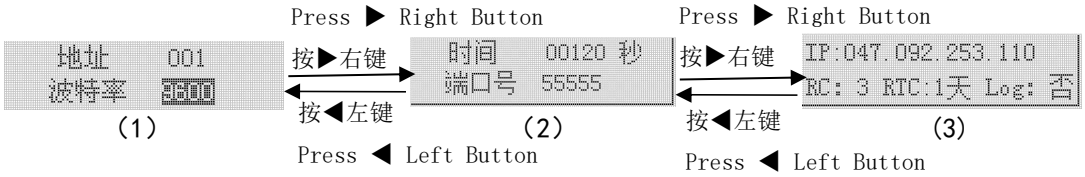
Select "1. Setting" and press ↵ button to enter the setting interface, then enter the password and press ↵ button to enter the setting page (default password: 0001), and press , buttons to select.



5.4.5.1. 通讯设置 Communication setting

选择“1.通讯设置”按↵ 键可对集中显示单元在线监控装置进行通讯设置，通过◀、▶键进行界面切换。

Select "1. Communication setting" and press ↵ button to set the communication for the online monitoring device of the centralized display unit, and switch the interface through ◀、▶ buttons.



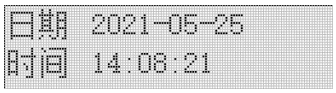
注 Note：

- 图（1）可以更改集中显示单元的地址及波特率；
- Figure (1) can change the address and baud rate of centralized display unit;
- 图（2）可以更改定时时间间隔以及上传服务器的端口号；
- Figure (2) can change the timing interval and the port number of the uploading server;
- 图（3）可以更改上传服务器的 IP 地址。
- Figure (3) can change the IP address of the upload server.

5.4.5.2. 时间设置 Time setting

选择“2.时间设置”按↵ 键可对集中显示单元在线监控装置进行时间设置。

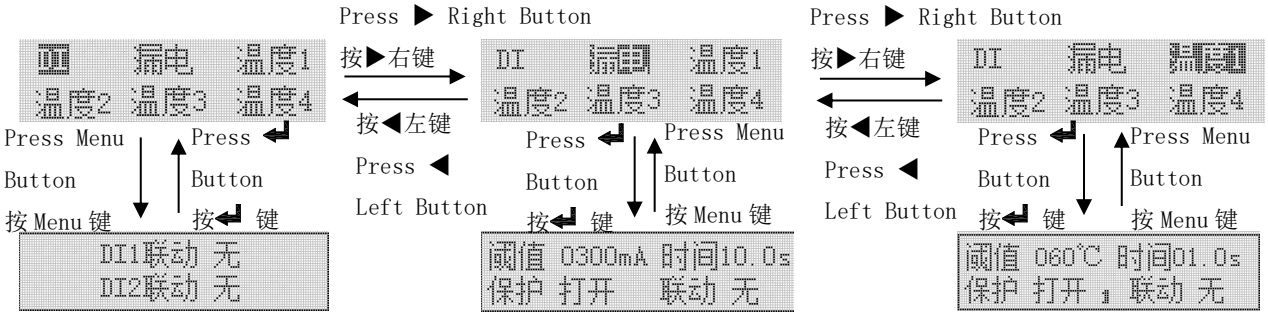
Select "2. Time setting" and press ↵ button to set the time for the online monitoring device of centralized display unit.



5.4.5.3. 保护设置 Protection setting

选择“3.保护设置”按↵ 键可对集中显示单元在线监控装置各通道进行保护设置。

Select "3. Protection setting" and press ↵ button to set protection for each channel of online monitoring device of centralized display unit.



注 Note：

1、通过◀、▶ 键可对漏电、温度、联动进行修改或设置

The leakage, temperature and linkage can be modified or set through ◀、▶ buttons

2、联动：用于开关量联动，若 DI1 联动 DO1，当 DI1 闭合时，DO1 也闭合。

Linkage: It is used for switch value linkage. If DI1 is linked with DO1, when DI1 is closed,

DO1 is also closed

3、漏电：检测短时间内的剩余电流，超过阈值进行报警，时间和阈值可随实际调整。

Leakage: It can detect the residual current in a short time, and alarm when it exceeds the threshold. The time and threshold can be adjusted according to the actual situation.

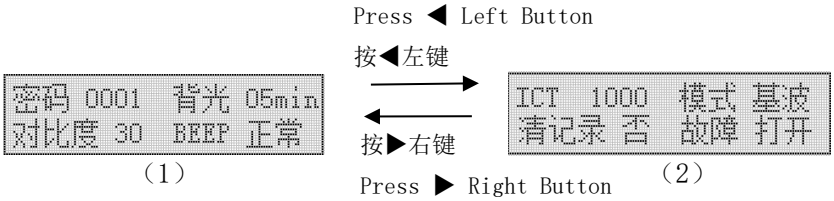
4、温度：检测短时间内的温度，超过阈值进行报警，时间和阈值可随实际调整。

Temperature: It can detect the temperature in a short period of time, and alarm when it exceeds the threshold. The time and threshold can be adjusted according to the actual situation.

5.4.5.4. 功能设置 Function setting

按↵ 键选择“4.功能设置”可对集中显示单元在线监控装置进行功能设置。功能设置下的几个页面通过左键、右键进行切换各界面参数说明如下。

Select "4. Function setting" and press ↵ button to set the function of online monitoring device of centralized display unit. Several pages under the function settings can be switched through , buttons. The parameters of each interface are explained as follows.



（1） （2）

注：

- 图（1）密码为设置密码，可以修改默认密码；背光选项下可以选择背光亮起的时间；对比度可调整仪表的对比度大小；BEEP 可以选择正常、报警或者关闭。
- The password in Figure (1) is the setting password, the default password can be modified. The backlight lighting time can be selected under the backlight option. The contrast ratio of the meter can be adjusted. BEEP can be selected as normal, alarm or off.
- 图（2）漏电流变比可调节，模式可以选择基波或者全波；清记录，选择是选项则会清空当前事件记录；故障可以选择是否打开。
- The leakage current transformation ratio in Figure (2) can be adjusted, and the mode can be selected as fundamental wave or full wave. “Clear record” can select Yes option to clear the current event record. Fault can choose whether to open or not.

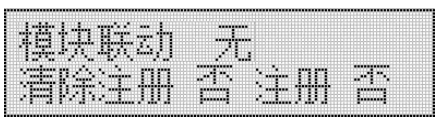
设置完成后按↵ 回车键确认，再按 Menu 键返回，直到是否保存设置界面时，此时通过按◀、▶键来进行是否选择保存数据，按↵ 回车键确认并退出设置界面。

After completing the settings, you need to press ↵ button to confirm, and then press Menu button to return to whether to save the setting interface. At this time, press ◀、▶ buttons to select whether to save the data, then press ↵ button to confirm and exit the setting interface.

5.4.5.5. 模块设置 Module setting

选择“5.模块设置”按↵ 键可对模块进行联动、注册和清除注册的相关设置。

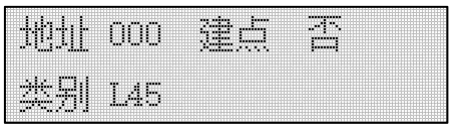
Select "5. Module Setting" and press ↵button to link, register and clear the related settings of the module.



5.4.5.6.　　增加点位 Add point

选择“6.增加点位”按↵ 键可选择是否新建点，并设置新建点的地址、类型。

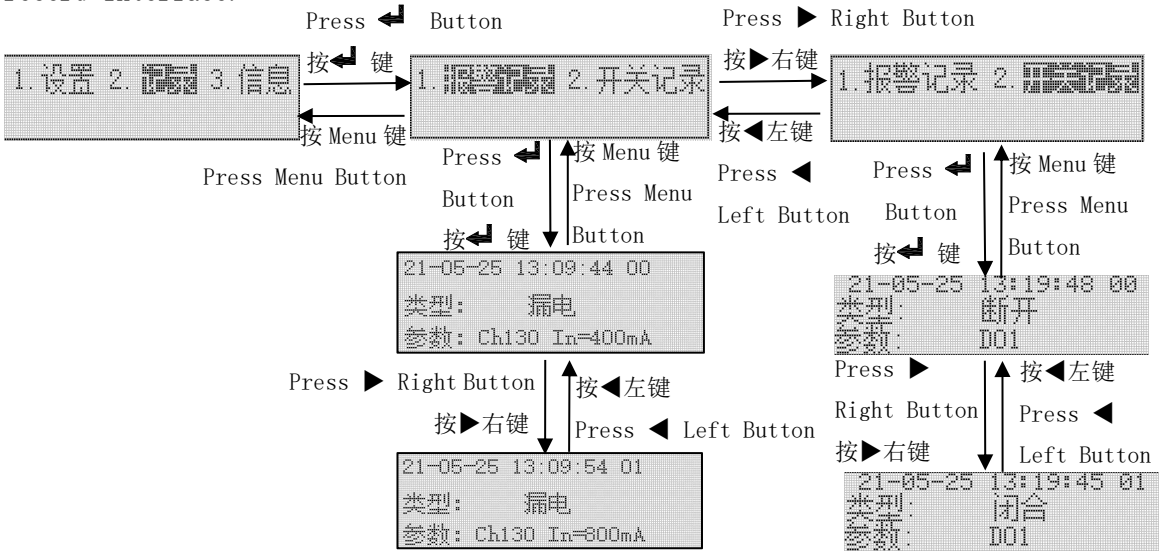
Select ″6. Add point″ and press ↵button to choose whether to create a new point or not, and set the address and type of the new point.



5.4.6.　事件记录 Event Logging

在菜单界面通过◀、▶键选择“2.记录”按↵ 键进入记录界面。

In the menu interface, use◀、▶buttons to select “2. Record” and press ↵button to enter the record interface.



注 Note：

1）报警记录右上角数据“00”表示第一条数据，之后的报警记录可依次为“01、02……39”（最多 40 条）。

The data "00" in the upper right corner of the alarm record represents the first data, and the subsequent alarm

2）开关记录右上角数据“00”表示第一条数据，之后的报警记录可依次为“01、02……59”（最多 60 条）。

The data "00" in the upper right corner of the switch record represents the first data, and the subsequent alarm records can be "01, 02...59" (up to 60).

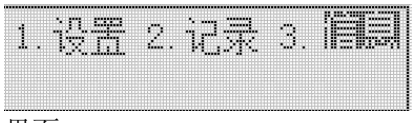
3）数据记录按◀ 左键或▶ 右键进行界面切换。

Press ◀ left button or ▶ right button to switch the interface of data record.

5.4.7.　信息界面 Information interface

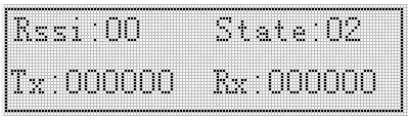
在通道状态显示界面下，按 MENU 菜单键进入菜单界面。

In the menu interface,　press MENU button to enter the recording interface.



选择“3.信息”按↵ 键进入信息界面。

Select ″3. Information″ to press ↵button to enter the information interface.



信息界面（1）

Information interface (1)

信息界面（1）界面下，显示的值共有四个，含义如下：

On the information interface (1), there are four values, and the meaning is as follows:

- **Rssi**：Rssi 后显示的是当前的信号值

  The current signal value is displayed after RSSI.

- **State**：State 后显示是当前模块的状态，有 0~9 共十种状态，其中 0~9 对应的数字含义如下:

  State indicates the status of the current module. There are ten states from 0 to 9. The meanings of numbers from 0 to 9 are as follows:

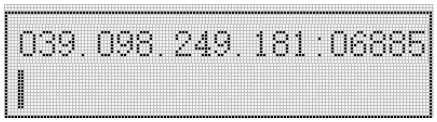
  - 0 初始化 Initialization
  - 1 获取 IMEI 序列号 Obtain the serial number of the IMEI
  - 2 检查 SIM 卡 获取卡号 Check the SIM card number
  - 3 设置网络模式 Set the network mode
  - 4 等待 GPRS 附着 Wait for GPRS to attach
  - 5 检查信号值 Check signal values
  - 6 设置联网模式 Set the networking mode
  - 7 连接服务器 Connect to the server
  - 8 服务器已连接 The server has been connected
  - 9 关闭服务器连接 Disconnect the server

- TX：TX 后显示的是发送数据个数

  The number of sent data is displayed after TX.

- Rx：Rx 后显示的是接收数据个数

  The number of reception data is displayed after RX.

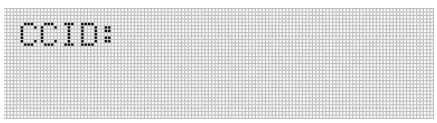


信息界面（2）

Information interface (2)

信息界面（2）界面下，第一行显示连接服务器的 IP 以及端口号,第二行显示的是域名（若未设置域名则无显示）

On the information interface (2), IP address and port number connected to the server are displayed in the first line of the interface. The second line displays domain name (if no domain name is set).

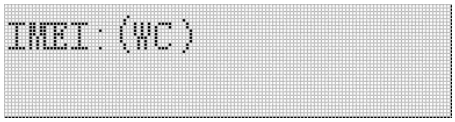


信息界面（3）

Information interface (3)

信息界面（3）界面下，CCID 后面的数字为 SIM 卡号。若 CCID 有 SIM 卡号显示，则表示仪表中 SIM 卡已插好。若 CCID 后没有 SIM 卡号显示，如信息界面（3）所示，则表示 SIM 卡没有插好或者仪表中没有 SIM 卡。

On the information interface (3), the number next to CCID is the SIM card number. If the SIM card number is displayed in CCID, the SIM card is inserted properly. If the SIM card number is not displayed after CCID, as shown in (3), it indicates that the SIM card is not properly inserted or there is no SIM card in the meter.



信息界面（4）
Information interface (4)

信息界面（4）界面下，IMEI（WC）下面的数字为模块序列号。

On the information interface (4), the number below IMEI (WC) is the module serial number.

信息界面（5）
Information interface (5)

信息界面（5）界面下，SN 为软件编号，V 为软件版本，ser 后的数字字母组合的序列表示的是该仪表编号。

On the information interface (5), SN is the software number, V is the software version, and the sequence of alphanumeric combination after SER represents the meter number.

6. 功能应用 Function application

6.1.剩余电流监测检测 Residual current monitoring and detection

在线检测配电线路的剩余电流，当超过剩余电流报警设定值，且持续时间超过延时设定值后，执行报警的操作。可以根据线路正常漏电流的大小设定报警设定值 I_{Δ}n，在该值的设置上应遵循不小于被保护电气线路正常泄漏电流最大值的两倍，且不大于 1000mA。对装设二级或多级剩余电流保护的场所，上一级的剩余电流报警设定值必须大于下一级的剩余电流报警设定值；并且上一级的延时要大于下一级的延时。

Detect the residual current of the distribution line online. When the residual current exceeds the alarm set value and the duration exceeds the delay set value, it will perform the alarm operation. The alarm setting value I_{Δ}n can be set according to the normal leakage current of the line. The setting value should be no less than two times of the maximum normal leakage current of the protected electrical line and no more than 1000mA. For the place equipped with two or multi-level residual current protection, the residual current alarm set value of the upper level must be greater than the residual current alarm set value of the next level. And the delay of the upper level is greater than the delay of the lower level.

参数 Parameter	范围 Range	步长 Step length
剩余电流报警设定值 Residual current alarm setting value	20~1000mA	1mA

动作延时时间 Action delay time	0.1~60.0S	0.1S
保护方式 Protection mode	关闭/打开 Off/On	
联动开关 Linkage switch	无/DO1/DO2/DO1&2 None/DO1/DO2/DO1&2	

保护方式：剩余电流保护方式可以设置为关闭、打开，联动可以设置为无、DO1、DO2、DO1&2。在保护方式打开和联动处于 DO1/DO2/DO1&2 状态下当检测到剩余电流值超过报警值，并达到动作延时后触发相应动作。若在延时过程中，剩余电流值小于剩余电流报警设定值时，不会动作。

Protection mode: Residual current protection mode can be set to off or on, linkage can be set to none, DO1, DO2, DO1&2. When the protection mode is turned on and the linkage is in DO1/DO2/DO1&2 state, the corresponding action will be triggered when the residual current value exceeds the alarm value and the action delay is reached. If in the delay process, the residual current value is less than the residual current alarm set value, no action.

出厂默认剩余电流报警设定值为 300mA，动作延时时间为 10.0S，保护方式为关闭。

The default residual current alarm setting is 300mA, the action delay time is 10.0s, and the protection mode is off.

6.2. 温度监测 Temperature monitoring

通过温度传感器监测配电箱、线缆或线缆连接处的温度，超过温度动作设定值时，延时一定时间，执行报警或者断开断路器的操作。温度传感器的安装必须固定稳定，防止跌落造成线路短路。

Use a temperature sensor to monitor the temperature of the power distribution box, cables, or cable connections. When the temperature exceeds the setting value, it will delay a certain time and perform the operation of alarming or disconnecting the circuit breaker. The installation of temperature sensors must be fixed and stable to prevent short circuit caused by falls.

参数 Parameter	范围 Range	步长 Step length
温度报警设定值 Temperature alarm setting value	45.0~140.0℃	1℃
动作延时时间 Action delay time	0.1~60.0S	0.1S
保护方式 Protection mode	关闭/打开 Off/On	
联动开关 Linkage switch	无/DO1/DO2/DO1&2 None/DO1/DO2/DO1&2	

保护方式：温度保护模式可以设置为关闭、打开，联动可以设置为无、DO1、DO2、DO1&2。在保护方式和联动开关处于 DO1/DO2/DO1&2 状态下当检测到温度值超过报警值，并达到动作延时后触发相应动作。若在延时过程中，温度值下降到温度报警设定值时，不会动作。

Protection mode: Temperature protection mode can be set to off or on, linkage can be set to None, DO1, DO2, DO1&2. In the DO1/DO2/DO1&2 state of the protection mode and linkage switch, when

the temperature exceeds the alarm value and reaches the action delay, the corresponding action will be triggered. If in the delay process, the temperature value drops to the temperature alarm set value, no action.

出厂默认温度报警设定值是60℃，动作延时时间为1.0S，保护方式为关闭。

Protection mode: Temperature protection mode can be set to off or on, linkage can be set to None, DO1, DO2, DO1&2. In the DO1/DO2/DO1&2 state of the protection mode and linkage switch, when the temperature exceeds the alarm value and reaches the action delay, the corresponding action will be triggered. If in the delay process, the temperature value drops to the temperature alarm set value, no action.

6.3.消防联动功能 Fire linkage function

当发生火灾时，消防联动系统发出指令，通过装置使断路器脱口，强制切断非消防设备的电源。装置接收到消防联动信号后，将根据相关的动作设置做出相应的保护动作。

When there is a fire, the fire linkage system issues instructions, through the device to make the circuit breaker blurt out, forcibly cut off the power supply of non-fire equipment. After receiving the fire linkage signal, the device will make the corresponding protection action according to the relevant action Settings.

出厂默认保护方式为关闭。

The factory default protection mode is disabled.

6.4. 自检功能 Self-checking function

装置具备自检功能，在主页界面长按回车键确认，系统将进入自检状态，查看设备是否完好。

The device has the function of self-check. On the home screen, long press Enter button to confirm, the system will enter the self-check state to check whether the device is in good condition.

6.5. 消音功能 Muffler function

在故障或报警状态下，切换至主页界面，长按左键消音并确认，装置报警声音消除。

In the fault or alarm state, switch to the master interface, long press left button to mute and confirm, the alarm sound of the device will be eliminated.

6.6. 报警复位（解除报警）Alarm reset (disarming alarm)

当发生报警时，可通过按键复位继电器的输出状态；如果在进行复位操作后未排除报警故障，装置将再次进入故障报警或脱扣状态。

When the alarm occurs, the output state of the relay can be reset by pressing the button. If the alarm fault is not eliminated after the reset operation, the device will enter the fault alarm or trip state again.

6.7. 集中监控 Centralized monitoring

集中显示单元通过二总线接收总线上模块的信息，发出报警信号及控制指令，及时断开故障线路。

The centralized display unit receives the information of the module on the bus through the two-bus, sends out alarm signals and control instructions, and disconnects the fault line in time.

7. 通讯协议 Communication protocol

7.1. 通讯协议概述 Overview of Communication Protocol

该装置使用 Modbus-RTU 通讯协议，Modbus 协议详细定义了校验码、数据序列等，这些都是特定数据交换的必要内容。Modbus 协议在一根通讯线上使用主从应答式连接（半双工），这意味着在一根单独的通讯线上信号沿着相反的两个方向传输。首先，主计算机的信号寻址到一台唯一的终端设备（从机），然后，终端设备发出的应答信号以相反的方向传输给主机。

The device uses modbus-RTU communication protocol, which defines in detail the check code, data sequence, etc., which are necessary for specific data exchange. The Modbus protocol uses a master-slave reply connection (half duplex) on one communication line, which means that signals travel in opposite directions on a single communication line. First, the signal from the main computer is addressed to a unique terminal device (slave machine), and then the reply signal from the terminal device is transmitted to the main computer in the opposite direction.

Modbus 协议只允许在主机（PC 等）和终端设备之间通讯，而不允许独立的终端设备之间的数据交换，这样各终端设备不会在它们初始化时占据通讯线路，而仅限于响应到达本机的查询信号。（默认通信设置值：地址为0001，波特率为9600）

Modbus protocol only allows communication between the host (PC, etc.) and terminal devices, not data exchange between independent terminal devices, so that terminal devices do not occupy the communication line when they are initialized, but only respond to the query signal reaching the local machine. (Default communication Settings: Address 0001, baud rate 9600)

7.1.1. 传输方式 Transmission mode

信息传输为异步方式，并以字节为单位，在主机和从机之间传递的通讯信息是11位格式，包含1个起始位、8个数据位（最低的有效位先发送）、无奇偶校验位、1个停止位。

The information is transferred asynchronously and in bytes. The communication information transmitted between the host and slave is in 11-bit format, including one start bit, eight data bits (the least significant bit is sent first), no parity bit, and one stop bit.

7.1.2. 信息帧格式 Information frame format

地址码 Address code	功能码 Function code	数据区 Data area	CRC 校验码 CRC check code
1 字节 1 byte	1 字节 1 byte	n 字节 n byte	2 字节 2 byte

地址码：地址码在帧的开始部分，由一个字节（8 位二进制码）组成，十进制为 0～255。这些位标明了用户指定的终端设备的地址，该设备将接收来自与之相连的主机数据。每个终端设备的地址必须是唯一的，仅被寻址到的终端会响应包含了该地址的查询。当终端发送回一个响应，响应中的从机地址数据便告诉了主机哪台终端正与之进行通信。

Address code: The address code consists of one byte (8-bit binary code) at the beginning of the frame and ranges from 0 to 255 in decimal notation. These bits identify the address of the user-specified terminal device that will receive data from the connected host. The address of each terminal device must be unique, and only the terminal addressed will respond to the query containing

that address. When a terminal sends back a response, the slave address data in the response tells the host which terminal is communicating with it.

功能码：功能码告诉了被寻址到的终端执行何种功能。下表列出了该系列装置用到的功能码，以及它们的意义和功能。

Function code: The function code tells the addressable terminal what function to perform. The following table lists the function codes used in this series of devices, as well as their meanings and functions.

功能 Function	定义 Definition	操作 Operation
03H	读数据寄存器 Read data register	获得一个或多个寄存器的当前二进制值 Get the current binary value of one or more registers
10H	预置多寄存器 Preset multiregister	设定二进制值到一系列多寄存器中 Set binary values to a series of multiple registers

数据区：数据区包含了终端执行特定功能所需要的数据或者终端响应查询时采集到的数据。这些数据的内容可能是数值、参考地址或者设置值。例如：功能码告诉终端读取一个寄存器，数据区则需要指明从哪个寄存器开始及读取多少个数据，内嵌的地址和数据依照类型和从机之间的不同内容而有所不同。

Data area: The data area contains the data required by the terminal to perform specific functions or the data collected when the terminal responds to queries. The content of this data may be numerical values, reference addresses, or setting values. For example, the function code tells the terminal to read a register, and the data area needs to specify which register to start from and how many data to read. The embedded address and data varies according to the type and content of the slave machine.

CRC 校验码：错误校验（CRC）域占用两个字节，包含了一个 16 位的二进制值。CRC 值由传输设备计算出来，然后附加到数据帧上，接收设备在接收数据时重新计算 CRC 值，然后与接收到的 CRC 域中的值进行比较，如果这两个值不相等，就发生了错误。

CRC check code: The error check (CRC) field takes up two bytes and contains a 16-bit binary value. The CRC value is calculated by the transmission device and then appended to the data frame. The receiving device recalculates the CRC value when it receives the data and then compares it with the value in the RECEIVED CRC field. If the two values are not equal, an error occurs.

生成一个 CRC 的流程为：

The process for generating a CRC is as follows:

1、预置一个 16 位寄存器为 0FFFFH（全 1），称之为 CRC 寄存器。

Preset a 16-bit register 0FFFFH (all 1s), which is called CRC register.

2、把数据帧中的第一个字节的 8 位与 CRC 寄存器中的低字节进行异或运算，结果存回 CRC 寄存器。

Xor operation is performed between the 8 bits of the first byte in the data frame and the lower byte in the CRC register, and the result is stored back to the CRC register.

3、将 CRC 寄存器向右移一位，最高位填以 0，最低位移出并检测。

Move the CRC register one bit to the right, fill the highest bit with 0, and move the lowest out and detect.

4、如果最低位为0，重复第三步（下一次移位）；如果最低位为1，将CRC寄存器与一个预设的固定值（0A001H）进行异或运算。

If the lowest level is 0, repeat the third step (next shift); If the least significant is 1, xOR is applied to the CRC register with a preset fixed value (0A001H).

5、重复第三步和第四步直到8次移位，这样处理完了一个完整的八位。

Repeat steps 3 and 4 until 8 shifts complete a full eight bits.

6、重复第2步到第5步来处理下一个八位，直到所有的字节处理结束。

Repeat steps 2 through 5 for the next octet until all byte processing is complete.

7、最终CRC寄存器的值就是CRC的值。

The final CRC register value is the CRC value.

此外还有一种利用预设的表格计算CRC的方法，它的主要特点是计算速度快，但是表格需要较大的存储空间，该方法此处不再赘述，请参阅相关资料。

There is also a method of calculating CRC using preset tables, which is characterized by fast computation but requires large storage space. This method is not described here, see related resources.

7.2. 功能码简介 Introduction to Function code

7.2.1. 功能码03H：读寄存器 Function code 03H: Read register

此功能允许用户获得设备采集与记录的数据及系统参数。主机一次请求的数据个数没有限制，但不能超出定义的地址范围。

This feature allows users to obtain data and system parameters collected and recorded by the device. There is no limit to how much data a host can request at a time, but the data cannot exceed the specified address range.

下面的例子是从地址01的集中显示单元读1个采集到的基本数据 （数据帧中每个地址占用2个字节）。以读取当前报警状态为例（其中报警状态所在的寄存器地址为1000H），读取报警状态为01表示当前仪表发出报警。

The following example reads 1 collected basic data from the centralized display unit at address 01 (2 bytes per address in the data frame). Take reading the current alarm state as an example (where the register address of the alarm state is 1000H), reading the alarm state as 01 means that the current meter sends an alarm.

主机发送		发送信息
地址码		01H
功能码		03H
起始地址	高字节	10H
	低字节	00H
寄存器数量	高字节	00H
	低字节	01H

从机返回		返回信息
地址码		01H
功能码		03H
字节数		02H
寄存器数据	高字节	00H
	低字节	01H
CRC	低字节	79H

CRC 校验码	低字节	80H
	高字节	CAH

校验码	高字节	84H

Send from host		Send information
Address code		01H
Function code		03H
Starting address	High byte	10H
	Low byte	00H
Number of register	High byte	00H
	Low byte	01H
CRC Check code	Low byte	80H
	High byte	CAH

Return from slave		Return information
Address code		01H
Function code		03H
Number of bytes		02H
Register data	High byte	00H
	Low byte	01H
CRC Check code	Low byte	79H
	High byte	84H

7.2.2. 功能码 10H：写寄存器 Function code 10H: Write register

功能码10H 允许用户改变多个寄存器的内容，该装置中时间日期可用此功能号写入。主机一次最多可以写入16个（32字节）数据。

Function code 10H allows the user to change the contents of multiple registers. The time and date in the device can be written by this function code. A host can write up to 16 (32 bytes) of data at a time.

下面的例子是预置地址为01的装置日期和时间为21年5月25日，12点12分00秒。其中周一到周日分别用1到7代替。

The following example is a device with preset address 01 with a date and time of 12:12:00 on 25/05/2021. Monday to Sunday are replaced by 1 to 7.

主机发送		发送信息
地址码		01H
功能码		10H
起始地址	高字节	11H
	低字节	00H
寄存器数量	高字节	00H
	低字节	03H
字节数		06H
1100H 待写入数据	高字节	15H
	低字节	05H
1101H 写入数据	高字节	19H
	低字节	0CH
1102H 待写入数据	高字节	0CH
	低字节	00H
CRC 校验码	低字节	BAH
	高字节	26H

从机返回		返回信息
地址码		01H
功能码		10H
起始地址	高字节	11H
	低字节	00H
寄存器数量	高字节	00H
	低字节	03H
CRC 校验码	低字节	85H
	高字节	34H

Send from host	Send information
Address code	01H

Return to slave	Return information
Address code	01H

Function code		10H
Starting address	High byte	11H
	Low byte	00H
Number of register	High byte	00H
	Low byte	03H
Number of bytes		06H
1100H Data to be written	High byte	15H
	Low byte	05H
1101H Write data	High byte	19H
	Low byte	0CH
1102H Data to be written	High byte	0 CH
	Low byte	00H
CRC Check code	Low byte	BAH
	High byte	26H

Function code		10H
Starting address	High byte	11H
	Low byte	00H
Number of register	High byte	00H
	Low byte	03H
CRC Check code	Low byte	85H
	High byte	34H

7.3.探测器参数地址表 Address table of detector parameter

7.3.1. 仪表报警相关参数地址表，起始地址 0x1000：

Address table of parameters related to meter alarm, starting address 0x1000：

序号	地址偏移量	参数	读写	数值范围	类型
1	0x1000	传感器报警状态	R	Bit0 = 1：报警 Bit0 = 0：不报警	Word
2	0x1001	DO 关联设置	R/W	B0-关联 DO1；B1-关联 DO2 Bit0 = 1：DO1 关联 Bit0 = 0：DO1 不关联 Bit1 = 1：DO2 关联 Bit1 = 0：DO2 不关联	Word
3	0x1002	DO 状态	R/W	B0-DO1；B1-DO2 Bit0 = 1：DO1 闭合 Bit0 = 0：DO1 打开 Bit1 = 1：DO2 闭合 Bit1 = 0：DO2 打开	Word
4	0x1003 低位	DI1 关联	R/W	B0-关联 DO1；B1-关联 DO2 Bit0 = 1：DO1 关联 Bit0 = 0：DO1 不关联 Bit1 = 1：DO2 关联 Bit1 = 0：DO2 不关联	Byte
	0x1003 高位	DI2 关联	R/W	B0-关联 DO1；B1-关联 DO2 Bit0 = 1：DO1 关 Bit0 = 0：DO1 不关联 Bit1 = 1：DO2 关联 Bit1 = 0：DO2 不关联	Byte
5	0x1004	DI 状态	R	B0-DI1；B1-DI2 Bit0 = 1：DI1 闭合 Bit0 = 0：DI1 打开 Bit1 = 1：DI2 闭合 Bit1 = 0：DI2 打开	Word
6	0x1005	蜂鸣器开关设置	R/W	蜂鸣器开关 0:关闭 1：仅报警	Word

				2：打开	
7	0x1006	当前报警回路	R	1-249	Word
8	0x1007	复位	R/W	读取数值为 0 写入 0x1234 时，清除报警（复位）	Word
9	0x1008	自检	R/W	读取数值为 0 写入 0x4321 时，自检	Word
10	0x1009	消音	R/W	读取数值为 0 写入 0x7259 时，消音。	Word
11	0x100A	模拟电弧报警	R/W	读取数值为 0 写入 0x1111 时，模拟电弧报警测试。	Word
12~100	0x100B~0x1063	预留	——	——	——

Serial Number	Address offset	Parameter	Read and write	Numerical range	Type
1	0x1000	Sensor alarm status	R	Bit0 = 1：Alarm. Bit0 = 0：No alarm.	Word
2	0x1001	D0 association setting	R/W	B0-associated with D01; B1-associated with DO2 Bit0 = 1：DO1 associated Bit0 = 0：DO1 not associated Bit1 = 1：DO2 associated Bit1 = 0：DO2 not associated	Word
3	0x1002	D0 status	R/W	B0-D01；B1-DO2 Bit0 = 1：DO1 off Bit0 = 0：DO1 on Bit1 = 1：DO2 off Bit1 = 0：DO2 on	Word
4	0x1003 low order	DI1 association	R/W	B0-associated with D01; B1-associated with DO2 Bit0 = 1：DO1 associated Bit0 = 0：DO1 not associated Bit1 = 1：DO2 associated Bit1 = 0：DO2 not associated	Byte
	0x1003 high order	DI2 association	R/W	B0-associated with D01; B1-associated with DO2 Bit0 = 1：DO1 associated Bit0 = 0：DO1 not associated Bit1 = 1：DO2 associated Bit1 = 0：DO2 not associated	Byte
5	0x1004	DI status	R	B0-DI1；B1-DI2 Bit0 = 1：DI1 off Bit0 = 0：DI1 on Bit1 = 1：DI2 off Bit1 = 0：DI2 on	Word
6	0x1005	Buzzer switch setting	R/W	Buzzer switch; 0: off; 1: only alarm; 2: on.	Word
7	0x1006	Current alarm loop	R	1-249	Word
8	0x1007	Reset	R/W	The read value is 0; When 0x1234 is written, the alarm is cleared (reset).	Word
9	0x1008	Self-check	R/W	The read value is 0;	Word

				When 0x4321 is written, self-check.	
10	0x1009	Silencer	R/W	The read value is 0; When 0x7259 is written, the sound is silenced.	Word
11	0x100A	Analog arc alarm	R/W	The read value is 0; When 0x1111 is written, simulate the arc alarm test.	Word
12~100	0x100B~0x1063	Reserved	——	——	——

7.3.2. 系统设置信息相关参数地址表，起始地址 0x1100：

Address table of parameters related to system setting information, starting address 0x1100:

序号 Serial Number	地址 Address offset	参数 Parameter	读写 Read and write	数值范围 Numerical range	类型 Type
1	0x1100 高位 0x1100high order	年	R/W	00-99	Byte
	0x1100 低位 0x1100 low order	月	R/W	1-12	Byte
2	0x1101 高位 0x1101high order	日	R/W	1-31	Byte
	0x1101 低位 0x1101 low order	时	R/W	0-23	Byte
3	0x1102 高位 0x1102high order	分	R/W	00-59	Byte
	0x1102 低位 0x1102 low order	秒	R/W	00-59	Byte
4~10	0x1103~0x1109	序列号	R	14 个字符组成产品编号	Char
11	0x110A	软件编号	R	1950	Word
12	0x110B	软件版本号	R	110（表示 V1.10）	Word
13	0x110C	通讯地址	R/W	1-247	Word
14	0x110D	通讯波特率	R/W	4800,9600,19200,38400	Word
15	0x110E	密码	R/W	1-9999	Word
16	0x110F	背光时间	R/W	0-99 min，0 表示常亮	Word
17	0x1110	液晶对比度	R/W	20-40，默认 30	Word
18	0x1111	故障使能	R/W	0 关闭；1 打开	Word
19	0x1112	ICT	R/W	10-9999	Word
20	0X1113	注册模块数	R	下行模块的数量	Word
21	0x1114	当前信号值	R	0-99. 0 或 99 表示当前无信号； 其他情况数值越大表示信号越好	Word
22	0x1115	无线报警或故障主动上报	R/W	0：不上报；1 上报	Word
23	0x1116	主动上传时间	R/W	单位 s，步长 1s，默认 120s	Word
24	0x1117	服务器 TCP 端口	R/W	0-65535	Word
25~26	0x1118~0x1119	服务器 IP 地址	R/W	4 个字节对应 IPV4，当全为 0 时域名方式启动	Byte
27~58	0x111A~0x1139	域名	R/W	64 个字符串	Char
59	0x113A	调试模式	R/W	1：调试模式（485 失效）；0：正常	Word
60	0x113B	服务器重连		默认 3 次，超过设定值服务器重连	Word
61	0x113C	网络校时		单位天，默认 1	Word
Serial Number	Address offset	Parameter	Read and write	Numerical range	Type

1	0x1100high order	Year	R/W	00-99	Byte
	0x1100 low order	Month	R/W	1-12	Byte
2	0x1101high order	Day	R/W	1-31	Byte
	0x1101 low order	Hour	R/W	0-23	Byte
3	0x1102high order	Minute	R/W	00-59	Byte
	0x1102 low order	Second	R/W	00-59	Byte
4~10	0x1103~0x1109	Serial Number	R	14 characters make up the product number	Char
11	0x110A	software number	R	1950	Word
12	0x110B	software version number	R	110 (representing V1.10)	Word
13	0x110C	mailing address	R/W	1-247	Word
14	0x110D	Communication baud rate	R/W	4800,9600,19200,38400	Word
15	0x110E	password	R/W	1-9999	Word
16	0x110F	Backlight time	R/W	0-99 min, 0 means always on	Word
17	0x1110	LCD contrast	R/W	20-40, default 30	Word
18	0x1111	fault enable	R/W	0 off; 1 on	Word
19	0x1112	ICT	R/W	10-9999	Word
20	0X1113	Number of registered modules	R	Number of Downstream Modules	Word
21	0x1114	current signal value	R	0-99. 0 or 99 means no signal currently; In other cases, the larger the value, the better the signal	Word
22	0x1115	Wireless alarm or fault active reporting	R/W	0: not report; 1 report	Word
23	0x1116	Active upload time	R/W	Unit: s, step length:1s, default 120s	Word
24	0x1117	Server TCP port	R/W	0-65535	Word
25~26	0x1118~0x1119	Server IP address	R/W	4 bytes correspond to IPV4. When all are 0, the domain name mode is activated.	Byte
27~58	0x111A~0x1139	domain name	R/W	64 strings	Char
59	0x113A	debug mode	R/W	1: debug mode (485 invalid); 0: normal	Word
60	0x113B	server reconnect		The default is 3 times, and the server reconnects if the set value is exceeded.	Word
61	0x113C	Network-Adjusted time		Unit: day, default 1	Word

7.3.3. 漏电温度相关参数地址表，起始地址 0x1200：

Address table of parameters related to leakage temperature, starting address 0x1200:

序号	地址偏移量	参数	读写	数值范围	类型
1	0x1200	通道类型	R	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：温度。 Bit = 0：漏电。	Word
2	0x1201	通道断线状态	R	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：断线。 Bit = 0：正常。	Word
3	0x1202	通道短路状态	R	B0-B4,B0：漏电，B1-B4，温度 1-4	Word

				Bit = 1：短路。 Bit = 0：正常。	
4	0x1203	报警状态	R	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：报警。 Bit = 0：正常。	Word
5	0x1204	预警状态	R	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：预警。 Bit = 0：正常。	Word
6	0x1205	漏电测量值	R	漏电 单位 mA	Word
7-10	0x1206-0x1209	温度 1-4 测量值	R	温度 单位 0.1℃；	Word
11-21	0x120A-0x1214	预留	——	——	——
22	0x1215	漏电报警值	R	漏电 单位 mA	Word
23-26	0x1216-0x1219	温度 1-4 报警值	R	温度 单位 0.1℃；	Word
27-37	0x121A-0x1224	预留	——	——	——
38	0x1225	DO1 关联	R/W	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：关联 DO1。 Bit = 0：不关联 DO1。	Word
39	0x1226	DO2 关联	R/W	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：关联 DO2。 Bit = 0：不关联 DO2。	Word
40	0x1227	保护开关	R/W	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：打开。 Bit = 0：关闭。	Word
41	0x1228	保护类型	R/W	0：有效值。 0xffff：基波。	Word
42	0x1229	漏电保护值	R/W	漏电 单位 mA	Word
43-46	0x122A-0x122D	温度 1-4 保护值	R/W	温度 单位 0.1℃；	Word
47-57	0x122E-0x1238	预留	——	——	——
58-62	0x1239-0x123D	保护时间	R/W	单位 0.1s	Word
63-100	0x123E-0x1263	预留	——	——	——
Serial Number	Address offset	Parameter	Read and write	Numerical range	Type
1	0x1200	Channel type	R	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: temperature Bit = 0: leakage	Word
2	0x1201	Channel disconnection status	R	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: disconnection Bit = 0: normal.	Word
3	0x1202	Channel short-circuit status	R	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: short circuit. Bit = 0: normal.	Word
4	0x1203	Alarm status	R	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: alarm. Bit = 0: normal.	Word
5	0x1204	Alert status	R	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: warning.	Word

				Bit = 0: normal.	
6	0x1205	Leakage measurement value	R	leakage Unit: mA	Word
7-10	0x1206-0x1209	Temperature 1-4 measurements	R	temperature Unit: 0.1℃；	Word
11-21	0x120A-0x1214	Reserved	——	——	——
22	0x1215	Leakage alarm value	R	leakage Unit: mA	Word
23-26	0x1216-0x1219	Temperature 1-4 alarm value	R	temperature Unit: 0.1℃；	Word
27-37	0x121A-0x1224	Reserved	——	——	——
38	0x1225	DO1 association	R/W	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: associated with DO1. Bit = 0: not associated with DO1.	Word
39	0x1226	DO2 association	R/W	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: associated with DO2. Bit = 0: not associated with DO2.	Word
40	0x1227	Protection switch	R/W	B0-B4,B0: leakage, B1-B4, temperature 1-4 Bit = 1: on Bit = 0: off	Word
41	0x1228	Type of protection	R/W	0: valid value. 0xffff: fundamental wave	Word
42	0x1229	Leakage protection value	R/W	Leakage Unit: mA	Word
43-46	0x122A-0x122D	Temperature 1-4 protection value	R/W	Temperature Unit: 0.1℃；	Word
47-57	0x122E-0x1238	Reserved	——	——	——
58-62	0x1239-0x123D	Protection time	R/W	Unit: 0.1s	Word
63-100	0x123E-0x1263	Reserved	——	——	——

7.3.4. 模块系统信息相关参数地址表，起始地址 0x1300：

Address table of parameters related to module system information, starting at 0x1300:

序号	地址	参数	读写	数值范围	类型
1	0x1300 高位	模块编号	R	0-255	Byte
	0x1300 低位				Byte
2	0x1301 高位				Byte
	0x1301 低位				Byte
3	0x1302 高位				Byte
	0x1302 低位				Byte
4	0x1303	软件编号	R	1XXX	Word
5	0x1304	软件版本号	R	100（表示 V1.00）	Word
6	0x1305 高 8 位	地址	R	1-249	Word
	0x1305 低 8 位	类型	R	TYPE_AFD 190 MT_L45 150 MT_L80 151 MT_L100 152 MT_L18030 153 MT_L65 154 MT_L15050 155	Word

				MT_L22050 156 MT_L260100 157 MT_L30050 158	
7	0x1306	使能	R	B8 Bit=0 关闭； Bit=1 打开；	Word
8	0x1307 高位	模块编号	R	0-255	Byte
	0x1307 低位				Byte
9	0x1308 高位				Byte
	0x1308 低位				Byte
10	0x1309 高位				Byte
	0x1309 低位				Byte
11	0x130A	软件编号	R	1XXX	Word
12	0x130B	软件版本号	R	100（表示 V1.00）	Word
13	0x130C 低 8 位	地址	R	0-32	Word
14	0x130C 高 8 位	类型	R	TYPE_AFD 190 MT_L45 150 MT_L80 151 MT_L100 152 MT_L18030 153 MT_L65 154 MT_L15050 155 MT_L22050 156 MT_L260100 157 MT_L30050 158	Word
	0x130D	使能	R	0 关闭； 1 打开；	Word

Serial Number	Address offset	Parameter	Read and write	Numerical range	Type
1	0x1300high order	Module number	R	0-255	Byte
	0x1300 low order				Byte
2	0x1301high order				Byte
	0x1301 low order				Byte
3	0x1302high order				Byte
	0x1302 low order				Byte
4	0x1303	Software serial number	R	1XXX	Word
5	0x1304	Software Version number	R	100（representing V1.00）	Word
6	0x1305 high 8 bits	Address	R	1-249	Word
	0x1305 low 8 bits	Type	R	TYPE_AFD 190 MT_L45 150 MT_L80 151 MT_L100 152 MT_L18030 153 MT_L65 154 MT_L15050 155	Word

				MT_L22050 156 MT_L260100 157 MT_L30050 158	
7	0x1306	Enable signal	R	B8 Bit=0 off; Bit=1 on;	Word
8	0x1307high order	Module number	R	0-255	Byte
	0x1307 low order				Byte
9	0x1308high order				Byte
	0x1308 low order				Byte
10	0x1309high order				Byte
	0x1309 low order				Byte
11	0x130A	Software serial number	R	1XXX	Word
12	0x130B	Software Version number	R	100（representing V1.00）	Word
13	0x130C low 8 bits	Address	R	0-32	Word
14	0x130C high 8 bits	Type	R	TYPE_AFD 190 MT_L45 150 MT_L80 151 MT_L100 152 MT_L18030 153 MT_L65 154 MT_L15050 155 MT_L22050 156 MT_L260100 157 MT_L30050 158	Word
	0x130D	Enable signal	R	0 off; 1 on;	Word

备注：以上为 2 个模块信息参数内容，剩余模块信息参数以此类推，最多可访问 32 个模块信息参数，第 32 个模块信息参数寄存器地址为 0x13d9~0x13df。

Note: The preceding two module information parameters can be accessed at most 32 module information parameters. The address of the 32nd module information parameter register is 0x13D9 to 0x13df.

7.3.5. 从模块测量参数地址表，起始地址 0x1400：

Address table of parameters related to slave module measurement, starting address 0x1400:

序号	地址	参数	读写	数值范围	类型
1	0x1400	报警状态	R	B0：故障电弧 Bit = 1：报警。 Bit = 0：正常。	Word
2-3	0x1401-0x1402	预留	——	——	——
4	0x1403	电流测量值	R	单位 0.1A	Word
5	0x1404	电弧测量值	R	0-99	Word
6-8	0x1405-0x1407	预留	——	——	——
9	0x1408	电流报警值	R	单位 0.1A	Word
10	0x1409	电弧报警值	R	0-99	Word
11-13	0x140A-0x140C	预留	——	——	——

14	0x140D	报警状态	R	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：报警。 Bit = 0：正常。	Word
15	0x140E	断线状态	R	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：断线。 Bit = 0：正常。	Word
16	0x140F	短路状态	R	B0-B4,B0：漏电，B1-B4，温度 1-4 Bit = 1：短路。 Bit = 0：正常。	Word
17-21	0x1410-0x1414	测量值	R	温度 单位 0.1℃； 漏电 单位 mA	Word
22-26	0x1415-0x1419	报警值	R	温度 单位 0.1℃； 漏电 单位 mA	Word
Serial Number	Address offset	Parameter	Read and write	Numerical range	Type
1	0x1400	Alarm status	R	B0：Arc fault Bit = 1：alarm Bit = 0：normal	Word
2-3	0x1401-0x1402	Reserved	——	——	——
4	0x1403	Current measured value	R	Unit: 0.1A	Word
5	0x1404	Arc measured value	R	0-99	Word
6-8	0x1405-0x1407	Reserved	——	——	——
9	0x1408	Current alarm value	R	Unit: 0.1A	Word
10	0x1409	Arc alarm value	R	0-99	Word
11-13	0x140A-0x140C	Reserved	——	——	——
14	0x140D	Alarm status	R	B0-B4,B0：leakage，B1-B4，temperature 1-4 Bit = 1：alarm Bit = 0：normal	Word
15	0x140E	Offline state	R	B0-B4,B0：leakage，B1-B4，temperature 1-4 Bit = 1：offline Bit = 0：normal	Word
16	0x140F	Short circuit state	R	B0-B4,B0：leakage，B1-B4，temperature 1-4 Bit = 1：short circuit Bit = 0：normal	Word
17-21	0x1410-0x1414	Measured value	R	Temperature unit: 0.1℃； Leakage unit: mA	Word
22-26	0x1415-0x1419	Alarm value	R	Temperature unit: 0.1℃； Leakage unit: mA	Word

备注：以上为 2 个模块测量参数内容，故障电弧模块寄存器内容以第一段为准，电气火灾模块寄存器内容以第二段为准。剩余模块测量参数以此类推，最多可访问 32 个模块测量参数，第 32 个模块测量参数寄存器地址为 0x1593~0x159f。

Note: The above is the measurement parameter content of two modules. The register content of the fault arc module is subject to the first paragraph, and the register content of the electrical fire module is subject to the second paragraph. The remaining module measurement parameters can be accessed at most 32 module measurement parameters, and the address of the 32nd module measurement

parameter register is 0x1593~ 0x159F.

7.3.6. 从模块报警保护参数地址表，起始地址 0x1600：

Address table of parameters related to slave module alarm protection, starting address 0x1600:

序号	地址	参数	读写	数值范围	类型
1	0x1600	保护电流	R/W	单位 0.1A	Word
2-7	0x1601-0x1606	预留	——	——	——
8	0x1607	半周波	R/W	0-99	Word
9-10	0x1608-0x1609	预留	——	——	——
11	0x110A 高位	灵敏度	R/W	1-9	Byte
	0x110A 低位	预留	——	——	——
12-13	0x110B-0x110C	预留	——	——	——
14	0x160D	漏电保护值	R/W	漏电 单位 mA	Word
15-18	0x160E-0x1611	温度 1-4 保护值	R/W	温度 单位 0.1℃；	Word
19-20+21 高 8 位	0x1612-0x1613 +0x1614 高 8 位	保护类型	R/W	B0-B4 Bit = 1：打开。 Bit = 0：关闭。	Byte
21 低 8 位 +22-23	0x164 低 8 位 +0x1615-0x1616	保护时间		单位 1s	Byte
24-26	0x1617-0x1619	预留	——	——	——
Serial Number	Address offset	Parameter	Read and write	Numerical range	Type
1	0x1600	Protection current	R/W	Unit: 0.1A	Word
2-7	0x1601-0x1606	Reserved	——	——	——
8	0x1607	Half cycle	R/W	0-99	Word
9-10	0x1608-0x1609	Reserved	——	——	——
11	0x110A high order	sensitivity	R/W	1-9	Byte
	0x110A low order	Reserved	——	——	——
12-13	0x110B-0x110C	Reserved	——	——	——
14	0x160D	Leakage protection value	R/W	Leakage unit: mA	Word
15-18	0x160E-0x1611	Temperature 1-4 protection value	R/W	Temperature unit: 0.1℃；	Word
19-20+21 high 8 bits	0x1612-0x1613+ 0x1614high 8 bits	Protection type	R/W	B0-B4 Bit = 1：on Bit = 0：off	Byte
21 low 8 bits +22-23	0x164 low 8 bits+0x1615-0x1616	Protection time		Unit: 1s	Byte
24-26	0x1617-0x1619	Reserved	——	——	——

备注：以上为 2 个模块报警保护参数内容，故障电弧模块寄存器内容以第一段为准，电气火灾模块寄存器内容以第二段为准。剩余模块报警保护参数以此类推，最多可访问 32 个模块报警保护参数，第 32 个模块报警保护参数寄存器地址为 0x1793~0x179f。

Note: The above are contents of alarm protection parameters of two modules. The register contents of fault arc module shall be subject to the first paragraph, and the register contents of electrical fire module shall be subject to the second paragraph. The remaining module alarm protection parameters can be accessed up to 32 module alarm protection parameters. The address of the 32nd

module alarm protection parameter register is 0x1793~ 0x179F.

7.3.7. 报警记录相关地址表，起始地址 0x1800：

Alarm record related address table, starting address 0x1800:

序号	地址	参数	读写	数值范围	类型
1	0x1800 高位	报警类型	R	0：无；1：漏电；2：温度；8：电弧；	Byte
	0x1800 低位	预留	——	——	Byte
2	0x1801 高位	报警地址	R	1-249；255 代表本地；	Byte
	0x1801 低位	报警电弧；通道	R	报警电弧个数；报警通道号	Byte
3	0x1802	报警值	R	电弧：单位 0.1A 漏电：单位 mA 温度：单位 0.1℃	Word
4	0x1803 高位	年	R	00-99	Byte
	0x1803 低位	月	R	1-12	Byte
5	0x1804 高位	日	R	1-31	Byte
	0x1804 低位	时	R	0-23	Byte
6	0x1805 高位	分	R	00-59	Byte
	0x1805 低位	秒	R	00-59	Byte
7	0x1806 高位	报警类型	R	0：无；1：漏电；2：温度；8：电弧；	Byte
	0x1806 低位	预留	——	——	Byte
8	0x1807 高位	报警地址	R	1-32；255 代表本地；	Byte
	0x1807 低位	报警电弧；通道	R	报警电弧个数；报警通道号	Byte
9	0x1808	报警值	R	电弧：单位 0.1A 漏电：单位 mA 温度：单位 0.1℃	Word
10	0x1809 高位	年	R	00-99	Byte
	0x1809 低位	月	R	1-12	Byte
11	0x180A 高位	日	R	1-31	Byte
	0x180A 低位	时	R	0-23	Byte
12	0x180B 高位	分	R	00-59	Byte
	0x180B 低位	秒	R	00-59	Byte
Serial Number	Address offset	Parameter	Read and write	Numerical range	Type
1	0x1800high order	Alarm type	R	0：null；1：leakage；2：temperature；8：arc；	Byte
	0x1800low order	Reserved	——	——	Byte
2	0x1801high order	Alarm address	R	1-249；255 represents local；	Byte
	0x1801low order	Alarm arc; channel	R	Number of alarm arc; Alarm channel number	Byte
3	0x1802	alarm value	R	arc：unit 0.1A leakage：unit mA temperature: unit 0.1℃	Word
4	0x1803high order	year	R	00-99	Byte
	0x1803low order	month	R	1-12	Byte
5	0x1804high order	day	R	1-31	Byte
	0x1804low order	hour	R	0-23	Byte
6	0x1805high order	minute	R	00-59	Byte
	0x1805low order	second	R	00-59	Byte

7	0x1806high order	Alarm type	R	0：null；1：leakage；2：temperature；8：arc；	Byte
	0x1806low order	Reserved	——	——	Byte
8	0x1807high order	Alarm address	R	1-32； 255 represents local；	Byte
	0x1807low order	Alarm arc; channel	R	Number of alarm arc; Alarm channel number	Byte
9	0x1808	alarm value	R	Arc: unit 0.1A Leakage: unit mA Temperature: unit 0.1℃	Word
10	0x1809high order	year	R	00-99	Byte
	0x1809low order	month	R	1-12	Byte
11	0x180Ahigh order	day	R	1-31	Byte
	0x180Alow order	hour	R	0-23	Byte
12	0x180Bhigh order	minute	R	00-59	Byte
	0x180Blow order	second	R	00-59	Byte

备注：以上为 2 条报警记录内容，0x1800~0x1805 为最新报警记录，剩余事件记录以此类推，最多可访问 40 条报警记录，第 40 条报警内容寄存器地址为 0x18ea~0x18ef。

Note: The above are two alarm records, 0x1800-0x1805 are the latest alarm records, and the rest of the alarm records can access a maximum of 40 alarm records, and the address of the 40th alarm content register is 0x18Ea-0x18EF.

7.3.8. 开关记录相关地址表，起始地址 0x1A00：

Switch record related address table, starting address 0x1A00:

序号	地址	参数	读写	数值范围	类型
1	0x1A00 高位	事件类型	R	0xf0:DI 打开；0xf1:DI 闭合 0x0f:DO 打开；0x1f:DO 闭合	Byte
	0x1A00 低位	通道	R	1，2	Byte
2	0x1A01 高位	年	R	00-99	Byte
	0x1A01 低位	月	R	1-12	Byte
3	0x1A02 高位	日	R	1-31	Byte
	0x1A02 低位	时	R	0-23	Byte
4	0x1A03 高位	分	R	00-59	Byte
	0x1A03 低位	秒	R	00-59	Byte
5	0x1A04 高位	事件类型	R	0xf0:DI 打开；0xf1:DI 闭合 0x0f:DO 打开；0x1f:DO 闭合	Byte
	0x1A04 低位	通道	R	1，2	Byte
6	0x1A05 高位	年	R	00-99	Byte
	0x1A05 低位	月	R	1-12	Byte
7	0x1A06 高位	日	R	1-31	Byte
	0x1A06 低位	时	R	0-23	Byte
8	0x1A07 高位	分	R	00-59	Byte
	0x1A07 低位	秒	R	00-59	Byte
Serial Number	Address offset	Parameter	Read and write	Numerical range	Type
1	0x1A00high order	event type	R	0xf0:DI on；0xf1:DI off 0x0f:DO on；0x1f:DO off	Byte
	0x1A00low	channel	R	1，2	Byte

	order				
2	0x1A01high order	year	R	00-99	Byte
	0x1A01low order	month	R	1-12	Byte
3	0x1A02high order	day	R	1-31	Byte
	0x1A02low order	hour	R	0-23	Byte
4	0x1A03high order	minute	R	00-59	Byte
	0x1A03low order	second	R	00-59	Byte
5	0x1A04high order	event type	R	0xf0:DI on；0xf1:DI off 0x0f:DO on；0x1f:DO off	Byte
	0x1A04low order	channel	R	1，2	Byte
6	0x1A05high order	year	R	00-99	Byte
	0x1A05low order	month	R	1-12	Byte
7	0x1A06high order	day	R	1-31	Byte
	0x1A06low order	hour	R	0-23	Byte
8	0x1A07high order	minute	R	00-59	Byte
	0x1A07low order	second	R	00-59	Byte

备注：以上为 2 条开关记录内容，0x1800~0x1803 为最新事件记录，剩余事件记录以此类推，最多可访问 60 条开关记录，第 60 条开关内容寄存器地址为 0x1aec~0x1aef。

Note: The previous two switch records, 0x1800-0x1803 are the latest event records, and the rest event records can access a maximum of 60 switch records. The address of the 60th switch content register is 0x1AEC to 0x1AEF.

8. 仪表常见故障分析 Analysis of common instrument failure

- 若仪表运行指示灯不亮，请检查电源是否接好；

  If the meter running indicator is not on, please check whether the power supply is properly connected;

- 若仪表状态指示灯闪烁，请检查仪表是否配置好或 SIM 是否插好；

  If the meter status indicator blinks, please check whether the meter is properly configured or whether the SIM is properly inserted;

9. 安装要求 Installation requirement

- 此仪表应安装在现场无线信号良好的地方；

  This meter should be installed in a place with good wireless signal on site;

- 必须让具有资格的安装人员安装此仪表，并且安装之前要仔细阅读使用说明；

  This equipment must be installed by a qualified installer and the instructions for use must be read carefully before installation;

● 接线时按照使用说明中的接线方式接线，接线完成后要认真核对接线是否正确，以免通电后损坏探测器、产生危险事故；

When wiring, follow the wiring method in the instructions for use. After the wiring is completed, carefully check whether the wiring is correct, so as to avoid damage to the equipment and dangerous accidents after power-on;

● 安装或拆除仪表时，请确认工作电源、待测母线及相关部分电源已切断以免发生触电，造成危险和人员伤害；

When installing or dismantling the instrument, please confirm that the working power supply, the busbar to be tested and the relevant part of the power supply have been cut off to avoid electric shock and cause danger and personal injury;

● 接线、布线请按相关规范要求，以免发生短路、断路等事故，同时也方便日后的维护和检修；

Please follow the relevant specifications for wiring to avoid accidents such as short circuits and open circuits, and also facilitate future maintenance and repairs;

● 仪表的正常运行依赖于正确的安装、设置和操作，安装之前请详细阅读安装、设置和操作的相关内容，以保证仪表的正常运行。

The normal operation of the equipment depends on the correct installation, setting and operation. Before installation, please read the relevant contents of the installation, setting and operation in detail to ensure the normal operation of the device.

更改记录

更改前	更改后	更改内容
/	V1.0	

总部：安科瑞电气股份有限公司
Headquarter: Acrel Co., LTD.
地址：上海市嘉定区育绿路 253 号
Address: No.253 Yulv Road Jiading District, Shanghai, China
电话：0086-21-69158338 0086-21-69156052 0086-21-59156392 0086-21-69156971
TEL.: 0086-21-69158338 0086-21-69156052 0086-21-59156392 0086-21-69156971
传真：0086-21-69158303
Fax: 0086-21-69158303
网址：www.acrel-electric.com
Web-site: www.acrel-electric.com
邮箱：ACREL008@vip.163.com
Email：ACREL008@vip.163.com
邮编：201801
Postcode: 201801

生产基地：江苏安科瑞电器制造有限公司
Manufacturer: Jiangsu Acrel Electrical Manufacturing Co., LTD.
地址：江苏省江阴市南闸街道东盟工业园区东盟路 5 号
Address： No.5 Dongmeng Road,Dongmeng industrial Park, Nanzha Street,Jiangyin City,Jiangsu Province,China
电话：0086-510-86179966
TEL：0086-510-86179966
传真：0086-510-86179975
Fax: 0086-510-86179975
网址： www.jsacrel.com
Web-site: www.jsacrel.com
邮箱： sales@email.acrel.cn
Email: sales@email.acrel.cn
邮编：214405
Postcode：214405

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