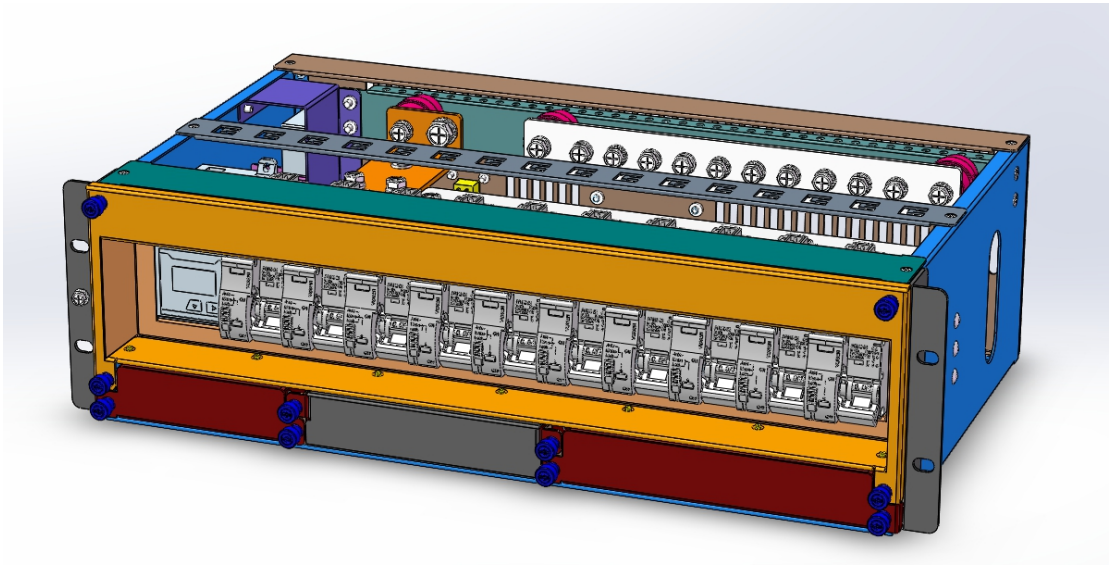


MT99-iPDU Base station DC intelligent power distribution unit

Manual Introduction

Document Version 1.3

Date 2020-02-22

Shanghai Matis Electric Co.,LTD

matismart
AIoT Electric

Introduction

Overview

The contents of this user manual include: component introduction, panel interface introduction, LCD interface introduction, Web user interface introduction, common operations, network management and hardware replacement. The user manual describes the complete function of the MT99-iPDU. Some functions rely on the accessories of products with different specifications. If your power distribution unit does not connect the corresponding product accessories to the MX20, you will not be able to use the described functions.。

The pictures involved in the user manual are for reference only, please refer to the actual product.

User

This document is mainly applicable to the following engineers:

- Sales Engineer
- Technical support engineer
- Maintenance engineer

Precautions

The following signs may appear in this article, and their meanings are as follows。

Sign	Description
⚠ 危险	Indicates a hazard with a high level of risk that will cause death or serious injury if not avoided.
⚠ 警告	Indicates a hazard with a medium risk that may cause death or serious injury if not avoided
⚠ 注意	Indicates a hazard with a low level of risk that may cause minor or moderate harm if not avoided

须知	Used to transmit equipment or environmental safety warning information. If it is not avoided, it may cause equipment damage, data loss, equipment performance degradation or other unpredictable results. "Notice" does not involve personal injury.。

Modify record

The modification record accumulates the description of each document update. The latest version of the document contains the updated content of all previous document versions

Document Version 1.3 (2020-12-28)

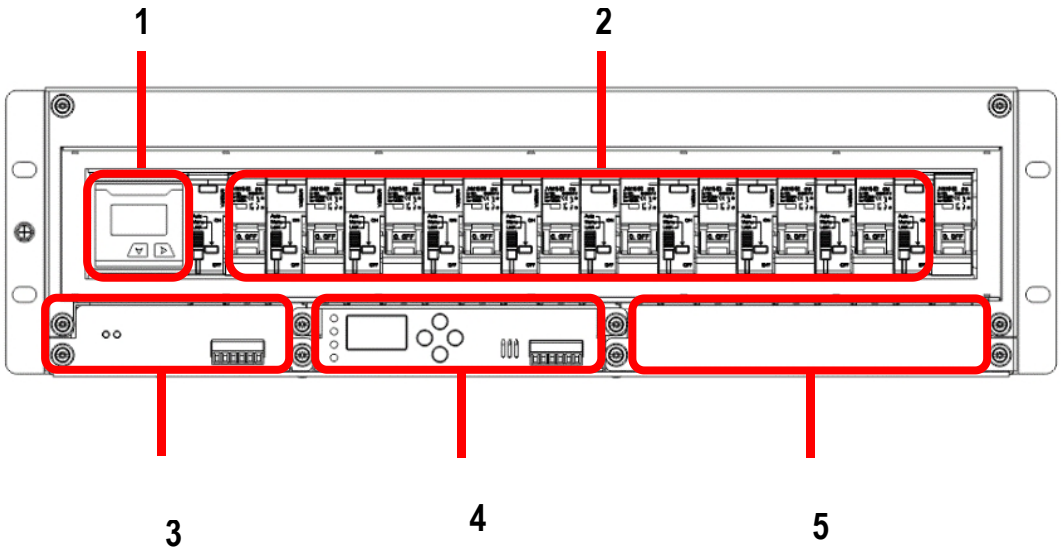
First official release

Catalogue

1 Product Introduction

1.1 Product Overview

Picture 1-1 Power distribution unit panel



1) Metering monitoring module MT58MD (compatible with control module MT99S-SMC)

2) Execution module MT53RSD48

3) AI module MT99-AI (compatible with mains diesel engine expansion module)

4) Control module MT99S-SMC

5) DTU Module

The DC power distribution unit system (hereinafter referred to as the system) adopts a modular design, which is composed of a DC power distribution unit, a branch power off and a branch metering part. The installation type is a standard 3U rack installation. The system is suitable for base station operators such as China towers, China telecommunications, China Mobile, and China Unicom.

1.2 Model and Type

Power distribution unit	Function description
Metering monitoring module MT58MD	MT58MD is a small and exquisite high-end monitoring module that supports monitoring and management of the power distribution unit system. Site power system management can be done through LCD, Web and local configuration software
Execution module MT53RSD48	MT53RSD48 is a DC 48V actuator, which can be controlled by 485 to realize remote locking and unlocking functions, as well as branch metering and control
MT99-AI Monitoring module	The MT99-AI monitoring module is a real-time detection of analog signals from grid power and battery power to achieve differentiated backup power

1.3 System Configuration

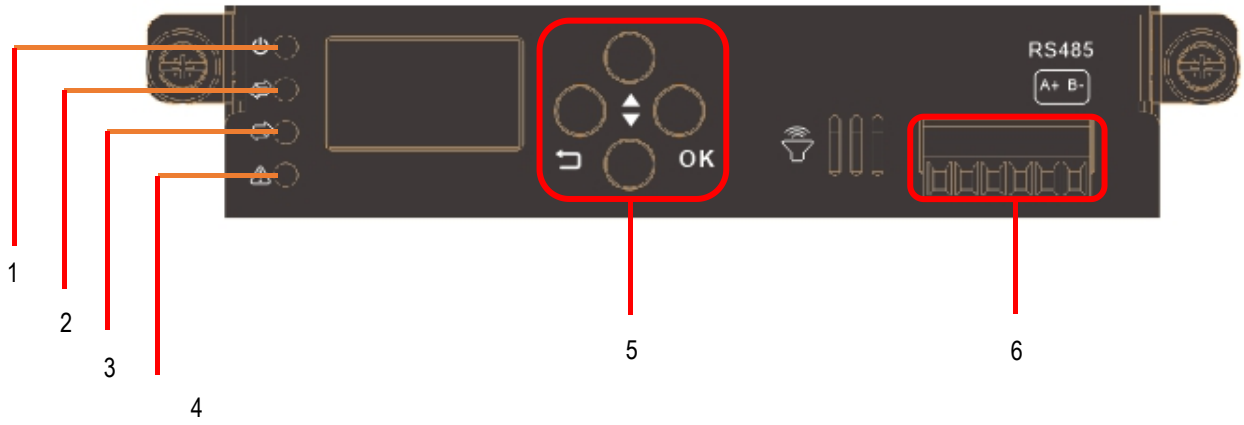
	Item	

System Configuration	Overall dimension l*w*h	482*264.4*132.2 (mm)
	DC output	Customer 1: Circuit breaker 63A/1P*3 Customer 1: Circuit breaker 63A/1P*3 Customer 3: Circuit breaker 63A/IP*3, 125A/IP*1

2 System components description

2.1 MT99S-SMC

Picture 2.1 SMC Control module appearance



(1) Operation indicator (2) Upload device indicator (3) Download device indicator

(4) Fault indicator (5) Operation buttons (6) RS485 terminal

Indicator Light

Item	status	Indicate introduction
Operation indicator	Normal green	System operation normally
	Normal red	System operation failure
Upload device indicator	Flashing	Normal communication with upload equipment
	Lights off	Communication failure
Download device indicator	Flashing	Normal communication with download equipment
	Lights off	Communication failure
Fault indicator	Flashing	System operation fault
	Lights off	System operation normally

Button

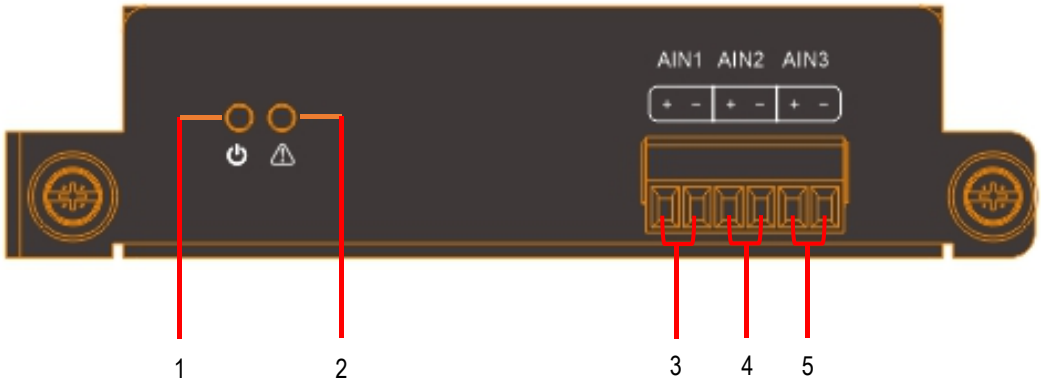
Button	Button name	Function description
▲	"up"	Press ▲ ▼ to scroll through the menu or select parameters
▼	"down"	
⮌	"back"	Return to the previous menu without saving the setting menu value
OK	"confirm"	Press OK in the stanby screen to enter the main menu Press OK in the main menu to enter the next submenu Press OK in the submenu setting to save the menu option value。

Terminal

Communication terminal	Communication parameter	Communication protocol
RS485	Baudrate:	TCP-Modbus protocol

	9600bit/s	

2.2 MT99S-IO



(1) Operation indicator (2) Fault indicator

(3) AIN1 (4) AIN2 (5) AIN3

Indicator Light

Item	Status	Indicate introduction
Operation indicator	Normal green	Grid power backup
	Normal red	Battery backup
	Lights off	No backup power status
Fault indicator	flashing	System operation fault
	Lights off	System operation normal

Terminal

Communication terminal	Communication parameter	Function description
AIN1 terminal		Grid power signal output
AIN2 terminal		DC generator output
AIN3 terminal		AC generator output

3 equipment installation

3.1 Installation instruction

⚠ 警告

MT99S-iPDU must be installed by professional electricians

The equipment manufacturer is not responsible for any damage caused by the user or installer failing to comply with the warnings or recommendations in this manual, or the use of non-original products, accessories or damage caused by this product.

⚠ 危险

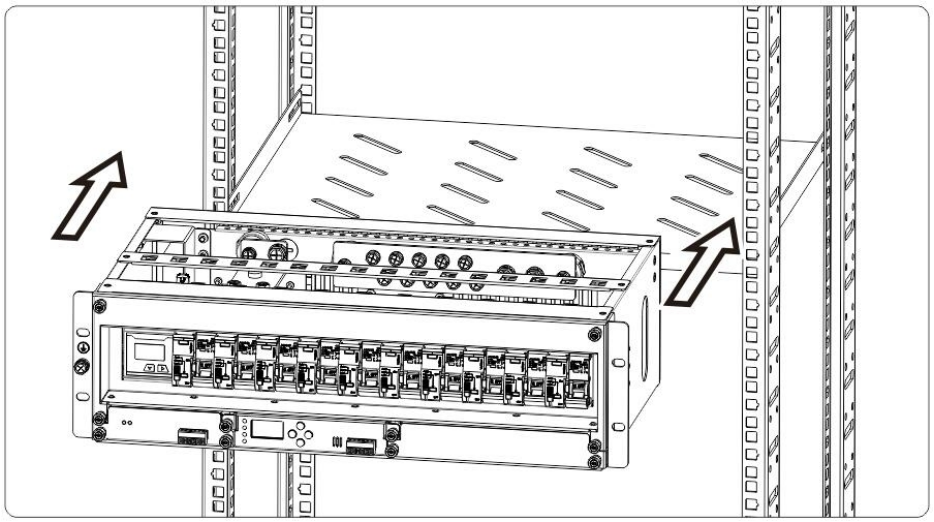
- When overhauling or troubleshooting the load side circuit, the working mode of the equipment must be switched to the mechanically locked status, and the safety lock position should be padlocked to ensure the safety of the maintenance personnel.
- After the full lock is pulled out, the device will enter a logical self-locking status, and the system will automatically restrain the handle at the opening position.
- Check that all input and output circuit breakers are in the open status. All

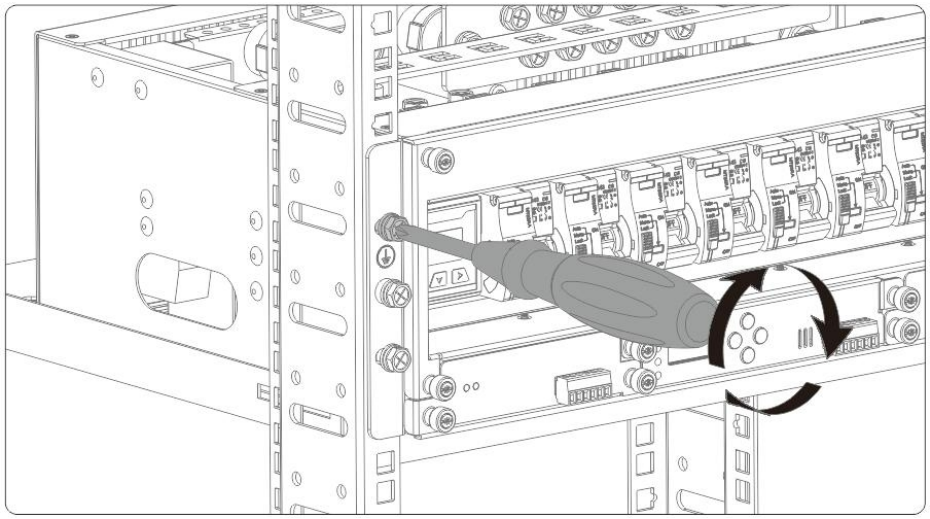
input and output connecting cables, signal cables, ground cables, and protective ground cables are firmly connected. And measure that there is no short circuit between the positive and negative busbars of the DC output and the positive poles and negative poles of the battery.

- Use a multimeter to measure the voltage of the positive and negative busbars of the system before setting the parameters.

3.2 Installation and Fix

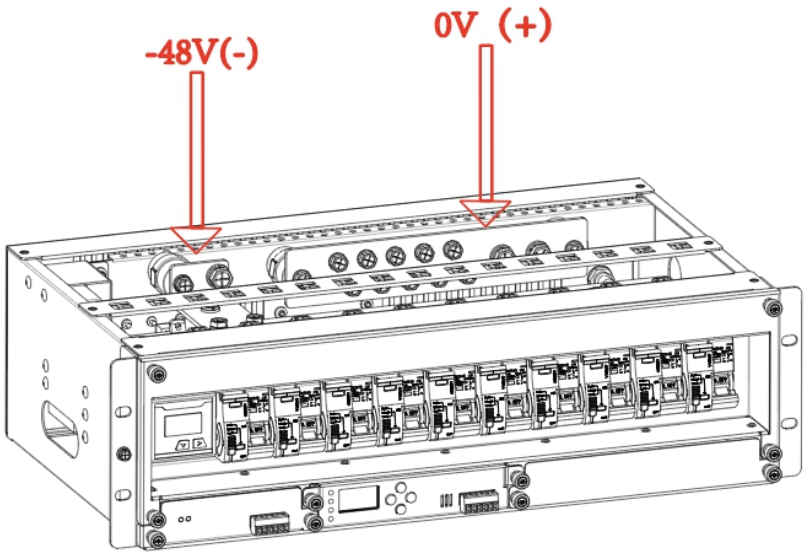
The installation type of the DC power distribution unit is a standard 3U rack installation, and the mounting screws are standard M6*15 screws





3.3 Main circuit wiring (input terminal) diagram

MT99S-iPDU It must be connected to the power circuit according to its voltage range.

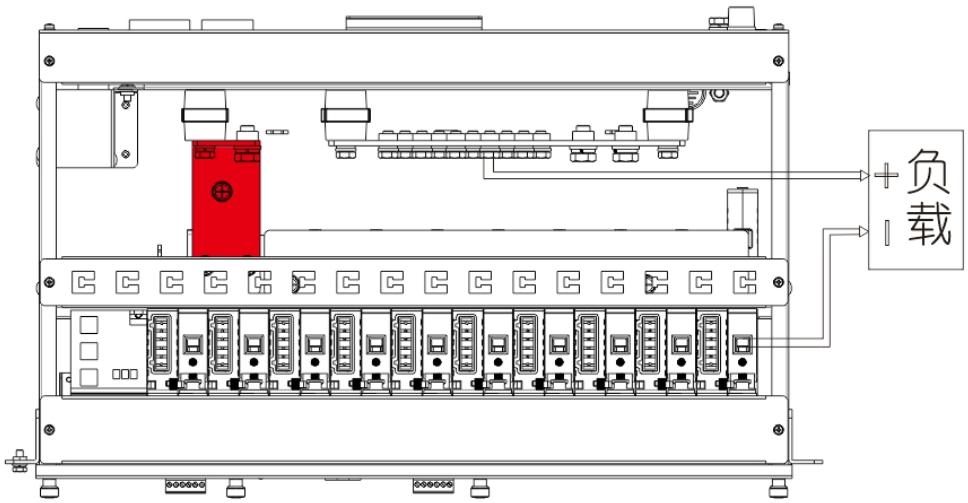


⚠ 注意

When installing the power distribution unit, you must pay attention to the wiring sequence of the positive and negative poles. If the system is wired in the reverse order, it will not work.

When installing the device, you must install the protective ground wire firstly; when removing the device, you must remove the protective ground wire in the end.

3.4 Load terminal wiring (output terminal) diagram



⚠ 注意

When installing the load, you must pay attention to the positive and negative line sequence of the wiring. If the system is wired in the reverse order, it will not work or even burn the connected load. So check all input and output circuit breakers are in the open status. All input and output connecting cables, signal cables, working ground cables, and protective ground cables are firmly connected. And measure that there is no short circuit between the positive and negative busbars of the DC output and the positive and negative poles of the battery.

⚠ 注意

1. （+）Power positive，0V（-）Power negative
2. Circuit breaker positive， 2. Circuit breaker negative
3. 

   Is the ground symbol

4 User Manual

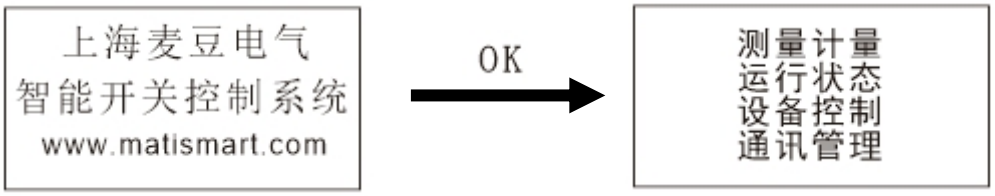
4.1 LCD Operation Interface

4.1.1 Standby screen

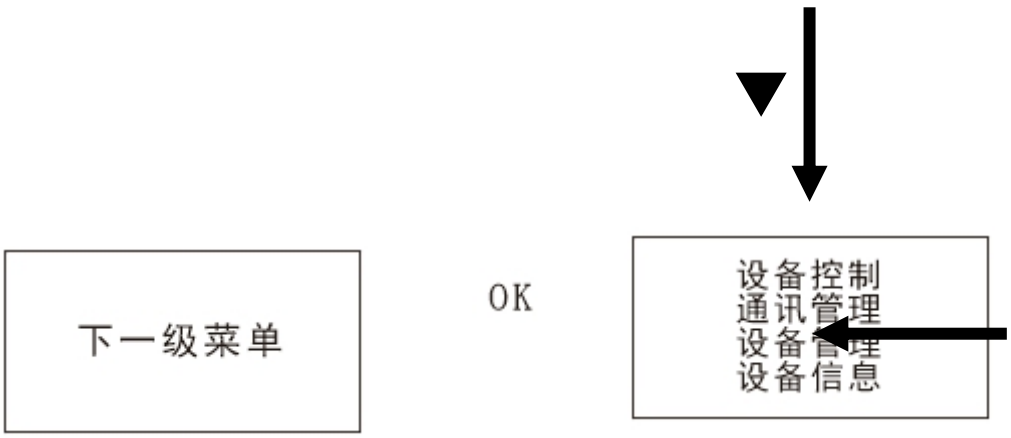
MT99S standby screen is shown in the figure below, and the user can see the company’ s basic information

If no key pressed within 1 minute on any LCD interface, it will automatically return to the standby screen.

4.1.2 Main Menu



As shown in the figure below, click the OK button



4.1.3 Measurement and metering

Step 1 View real-time data and historical data on the LCD interface, as shown in the following table

Main menu	Secondary menu	Three-level menu	Four-level menu	Last display
Measurement	Real-time data	Total real-time metering parameters		Voltage: 47.2V Current: 0.00A Power: 0.00W Electricity Consumption: 0.00KWH
		User 1 real-time measurement	Loop 1.2.3	
		User 2 real-time measurement	Loop 4.5.6	
		User 3 real-time measurement	Loop 7.8.9.10	
	History data	Total history data		Electricity consumption of last month 0.0kwh
		User 1 history data	Loop 1.2.3	
		User 2 history data	Loop 4.5.6	Electricity consumption of this month 0.0kwh
		User 3 history data	Loop 7.8.9.10	

4.1.4 Operation Status

Step 1 Check the status of the circuit breaker and the type of backup power on the LCD interface, as shown in the following table

Main menu	Secondary menu	Three-level menu	Four-level menu	Last display
Operation status	Circuit breaker status	User switch status	Loop switch status	Close/open Unlock/lock
		Other switch status		
		Generator switch status		

	Standby power status	User backup status	Loop back-up status	Backup power type Time：0 min Power reserve：0.0kwh Voltage：48V
		Other standby power status		
	AI Signal Detection			Electricity detection: Yes
				Oil generator detection: none
				Reserved detection: none
	Power supply type			Grid power/battery/oil generator

4.1.5 Equipment control

Main menu	Secondary menu	Three-level menu	Four-level menu	Last display
Equipment control	Enter the password (000001)	User control	Loop control	Open/close Lock/unlock

Step 1 Select device control on the LCD interface

Step 2 Enter the password (the password is 000001)

Step 3 Enter the control interface as shown in the following table

4.1.6 Communication Management

Step 1 View the parameter configuration of RS485 on the LCD interface

Main menu	First menu	Last display

Communication Management	RS485-1	Baudrate：9600（button △setup） Equipment Address：001（button△setup）
	RS485-2	
	RS485-3	

4.1.7 Equipment Management

Step 1 Set the user type on the LCD interface (set tenant)

Main menu	First menu	Last display
Equipment Management	Choose loop	Choose tenant

4.1.8 Equipment details

Step 1 Display the current hardware and software version information.

4.1.9 Host computer software use

Step 1 See attachment-host computer software instruction manual

5 RS485 Communication

5.1 MODBUS Protocol

The format 1363 of the ascii mode is in the modbus protocol. For the Modbus functions implemented in the device, is shown in "Appendix to Differentiated Backup Power Communication Protocol"。

5.2 MODBUS Communication parameter setup

The prerequisite for the communication between the device and the master station is whether the communication parameter settings are correct.

The communication parameters of MT99s-SMC include:

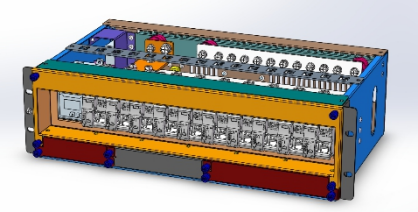
- Communication address: the default is 01, which can be modified locally, the data bit is 8 bits (low bit first, then high bit), the stop bit is 1 bit, and there is no parity bit.
- Baudrate: The default is 9600, which can be modified locally.
- A maximum of 254 base station differentiated backup equipment can be defined at the same site.

The communication parameters of MT99s-SMC include::

- Communication address: The default is 20, which can be modified locally, the data bit is 8 bits (low bit first, then high bit), the stop bit is 1 bit, and there is no parity bit.
- Baudrate: default 9600, can be modified locally

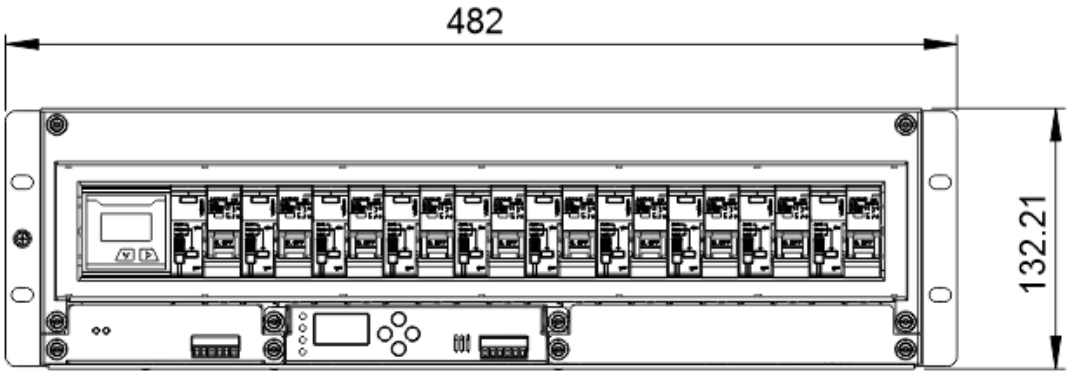
6 Technical characteristics

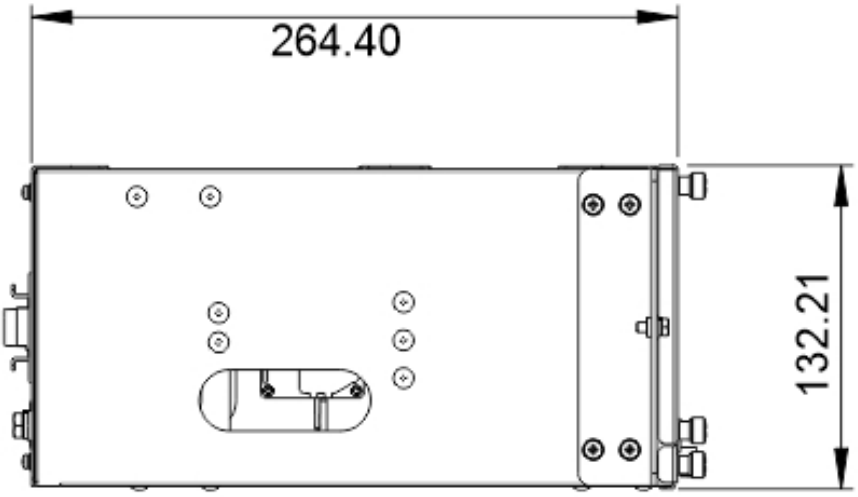
6.1Technical Parameter

Picture		
Function		
Manual/Auto	●	●
Open safety padlock	●	●
Open and close status query	●	●
Open, close	Host computer control/platform control	Host computer control/platform control
Lock, unlock	Host computer control/platform control	Host computer control/platform control
Automatic reclosing	Enable can be set	Enable can be set
Timing open and close settings	●	●
Backup power type setting	●	●
Oil generator service settings	●	●
Exemption period setting	●	●
Electrical characteristics		
Match with the current of the	63A 125A	

circuit breaker shell frame（A）	
Rated working voltage（Un）	DC24V~ DC48V
Rated insulation voltage（Ui）	300V
Rated frequency	50Hz 60Hz
Standby power consumption	≤ 1.2W
Mechanical properties	
Open time	0.1s
Close time	0.2s
Mechanical life	20000
Environmental characteristics	
Operation temperature	-25℃~+55℃
storage temperature	-35℃~+65℃
Relative humidity (non-condensing)	5%-95%
Highest altitude	2000 m
Protection grade	IP20
Communication parameters	
Baudrate	Default 9600 can be set
Check Digit	No verification
Data bit	8
Stop bit	1
Device address	Factory default address 1

6.1 Overall Dimensions





6 Common Questions

Question	Reason	Solution
System does not close automatically	reclosing function is disabled in auto mode	Set the reclosing power to enable through the host computer software
	Working mode setting is wrong	Push to change operation mode to Auto
	Reclosing failed and entered the logic self-locking status	unlock then close by the host computer software
no response after sending open/close command	The safety lock push button is set incorrectly	Please make sure that the indication of the safety lock push button is in the "Auto" position
	Abnormal communication line	Check whether the communication cable is disconnected
The host computer cannot communicate with this product	RS485 communication address is incorrect	Check whether the device address is consistent with the definition
	RS485 baudrate is incorrect	Check whether the device communication rate is consistent with the definition
	Communication link is disturbed	Check whether the communication shielding layer is well grounded

	Communication line is abnormal	Check whether the communication cable is disconnected
The host computer does not execute open and close	Undefined User code	Set the operator code through the host computer software
	Undefined loop	Define device information locally

7 Technical service

Anyone who purchases this intelligent power distribution unit enjoys a 24-month warranty from the date of purchase. During the warranty period, if the quality of the product has problem that affects normal use, it can be repaired and replaced free of charge. In case of irreparable damage caused by improper use, falling, incorrect installation and wiring, it can be repaired or replaced for a fee during the warranty period. If you disassemble and modify it by yourself, you will not be entitled to warranty service.

If you have any questions about the operation or malfunction of the equipment, please contact Matis technical support service.

Statement:

- The information provided in this manual can be modified without prior notice.
- Shanghai Matis Electric Co., Ltd. reserves the right to interpret the information

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