

## Auto Reclosing Device MT53R - RCD Instruction Manual

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Shanghai Matis Electric Co., Ltd.

# FOREWORD

## Overview

This manual includes: parts introduction, panel and interface introduction, installation and operation, module replacement, and introduction to the operation of the host computer software. The manual describes the complete functions of the MT53R.

The pictures of the device on the following pages are provided for reference only. Actual device features and specifications may vary.

## Target Persons

This manual is mainly applicable to the following:

- Sales Engineer
- Technical Support Engineer
- Maintenance Engineer

## Precautions

The following symbols may appear in this manual, and the meanings as list below:

Symbol	Meaning
	A hazard which, if not avoided, will result in a high risk of death or serious injury.
	A hazard with medium risk which, if not avoided, could result in death or serious injury.
	A hazard with a low risk which, if not avoided, could result in minor or moderate injury.
	Transmit device or environmental safety warning information. Failure to avoid it may result in device damage, data loss, reduced device performance or other unpredictable results. "Notice" does not involve personal injury.

## Revision Record

The revision record accumulates the description of each document update. The latest version of the documentation contains updates from all previous versions.

### Document Version 1.0 (2021-06-18)

This is the first official release.

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# 1. PRODUCT INTRODUCTION

## 1.1 Product Overview

Remote control device MT53R can match 1P-4P AC/DC circuit breaker, realize remote control of associated device through dry contact control, and feedback recloser status from signal output port.

The red LED light indicates that the device is in ON status and in normal use. The green LED light indicates that the device is in OFF status. And the red LED flashes to indicate that the device is faulty or manually open to enter the maintenance mode.

The automatic control mode, maintenance mode and padlock mode are optional through the toggle switch on the control module panel.

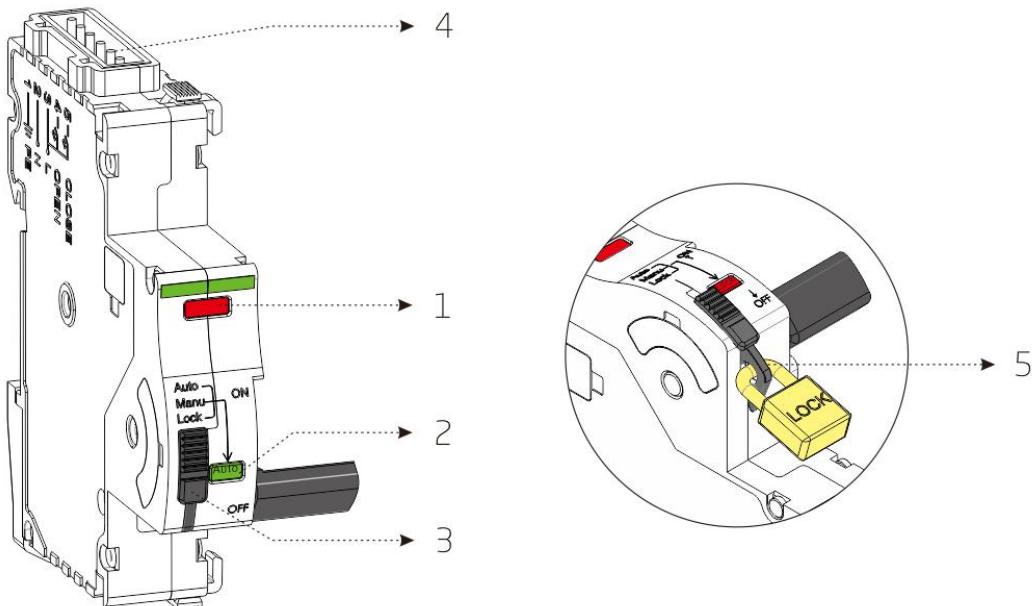
## 1.2 Specifications & Model Descriptions

MT	53	R	-/ -i -s -x	-	MCB	2P	C63
Enterprise Code	Design Number	Device Type	Function Code	Voltage	Adaptive Device	Poles	Current Specification
		Recloser	-/: no additional function -i: input by dry contact -s: RS485 -x: output in ON/OFF status	AC230V DC48V	Matis: MCB (MM50H) RCCB (ML50H) RCBO (MR50) Chint: NB1 Nader: NDB2		

Matis Circuit Breaker	Type	MCB	RCCB (AC)	RCBO (AC)
	Pole	1P, 2P, 3P, 4P	2P, 4P	1P, 1P+N, 2P, 3P, 3P+N, 4P
Trip Characteristics	Trip Characteristics	B, C, D	B, C, D	B, C, D

	Rated Current	10, 16, 20, 25, 32, 40, 50, 63, 80, 100, 125	10, 16, 20, 25, 32, 40, 50, 63	10, 16, 20, 25, 32, 40, 50, 63
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## 1.3 Appearance



(1) Status Indicator

(2) Working Mode Indication

(3) Working Mode Selection

(4) Terminal Block (5) Safety Lock Jack

## Features

- Ultra-small size: the minimum width is only 18mm, which is reduced by more than 1/2 compared with similar devices at home and abroad;
- In conjunction with different brands of devices: the circuit breakers of ABB, Schneider, Nader, etc.;
- Reliable performance: mechanical life is up to 20000 times, which is more than double that of domestic and foreign devices;
- Operating quickly: compared with similar devices at home and abroad, the speed is more than doubled;
- Multiple working modes: manual and automatic operating modes for

option, physical locking of the recloser;

- Double fulcrum parallel drive to effectively ensure the reliable synchronous close of 3P and above circuit breakers;
- Good fitness: DIN-rail side assembly;
- Energy saving and environmental protection, in line with RoHS requirements;
- RS485 communication, dry contact control, and ON/OFF status feedback can be added.

## Indicator

Table1-1 the Description of Status Indicator

Name	Color	Status	Description
Status Indicator		Green light on	Remote OFF status
		Red light flashing (once per second)	Manual or automatic OFF (maintenance mode)
		Red light on	Remote ON status (normal operation)

## Safety Lock Button

Table1-2 the Description of Safety Lock Button

Name	Color	Status & Description
Working mode indication (safety lock button)		Automatic mode (remote mode)
		Manual mode
		Lock mode(padlock is required in this mode)

# 2. DEVICE INSTALLATION

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## 2.1 Installation Instructions



Remote control device MT53RA must be installed by professional electrician.

The device manufacturer is not responsible for any damage caused by the user or installer's failure to follow warnings or recommendations in this manual, or damage caused by the use of non-original devices or accessories or by the quality of the device itself.

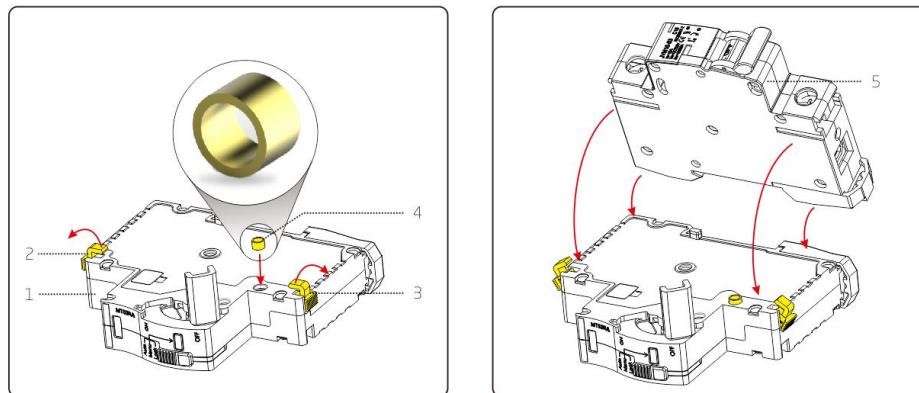


- The device must be switched to the mechanical locking status first when overhauling, and the padlock should be at the safety lock position for safety.
- After the safety lock is pulled out, the device will be in the logical self-locking status, and the handle will be constrained automatically to the OFF position.

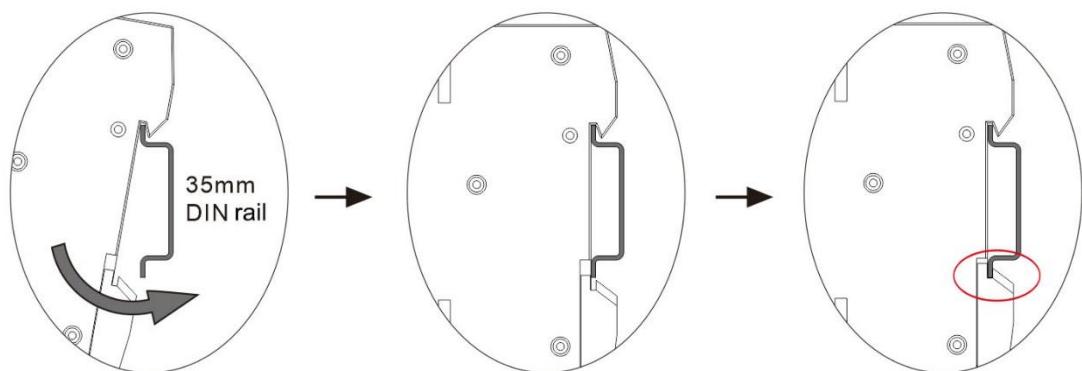
## 2.2 Installation and Fixing

Remote control device MT53RA is the unit specially designed for installation in distribution boxes or device cabinets with DIN rail fixing elements.

1. Assemble the circuit breaker and the recloser through accessories. (If you purchase a complete set, please ignore this step);



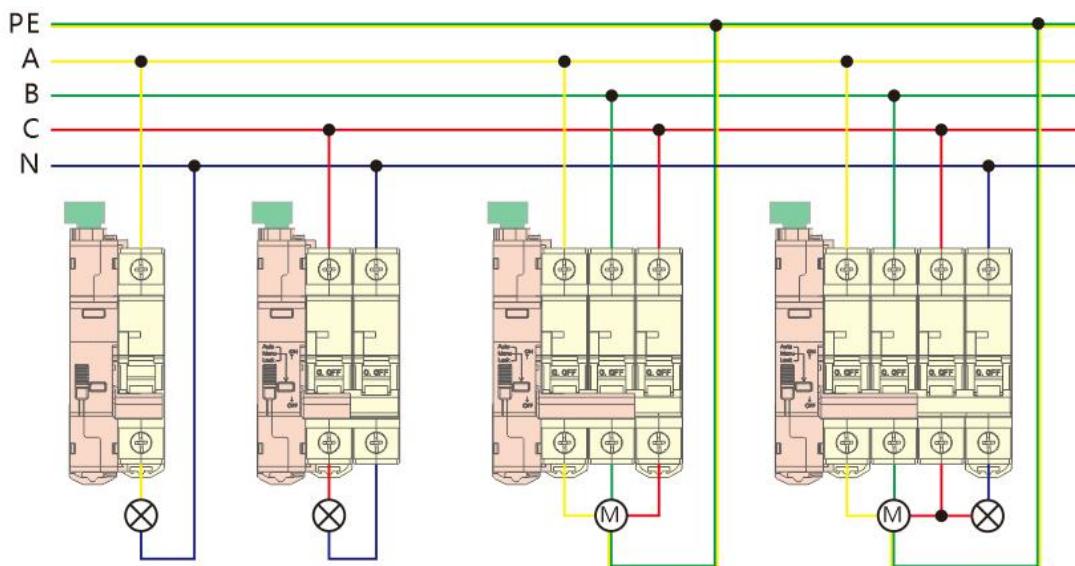
- ① Place the recloser flat on the plane
- ② Break apart the buckle 2 and the buckle 3
- ③ Install the copper bit in the position shown in the picture
- ④ Assemble the circuit breaker 5 on top of the recloser 1
- ⑤ Push back the buckle 2 and the buckle 3
2. Pull out the rail clips at the bottom of the device and hang the device on the DIN rail;
3. Rotate the device down until it is fastened to the lower part of the DIN rail and reset the buckles on the bottom of the device;



4. Make sure it is fastened to the rail.

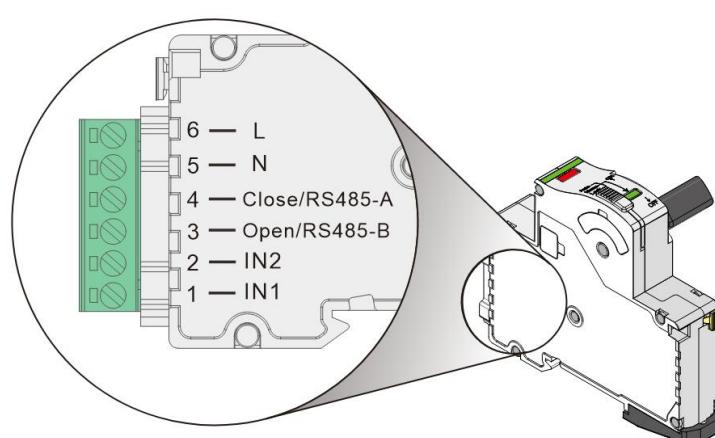
## 2.3 Main Circuit Wiring

The circuit breaker of the remote control device MT53RA must be connected to the power circuit according to its voltage range.

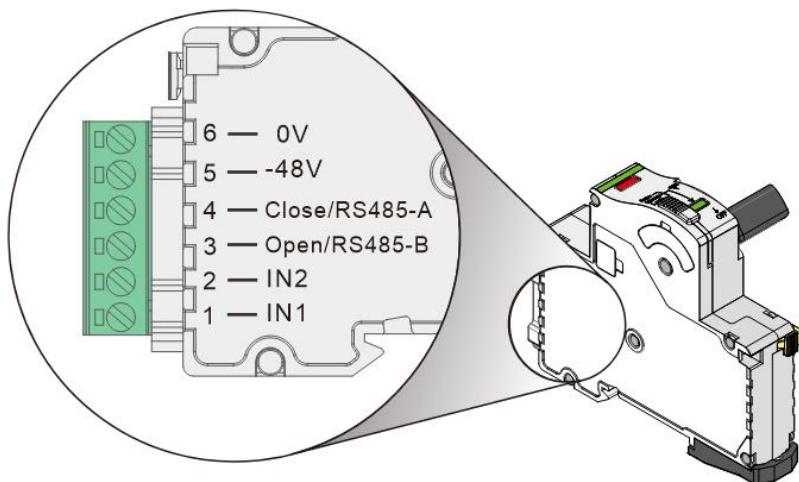


## 2.4 Terminal and Wiring

The control module of remote control device MT53RA must be connected to the power circuit according to its voltage range.



**(AC)**



**(DC)**

## Terminal Block

Table 2-1

Terminal Block Instructions (AC)

Interface	Parameter	Instruction	Device Specifications
L-⑥ N-⑤	AC:220V	Power supply	\
<b>DC~0V-⑥ DC~-48V-⑤</b>	DC: 48V	Power supply (DC)	\
<b>CLOSE-④ OPEN-③</b>	OPEN-OFF Close-ON	Dry contact control	©
<b>A-④ B-③</b>	RS485-A RS485-B	RS485 interface	MT53RAs ver. MT53RAsx ver.
<b>②&amp;①-AUX</b>	AUX- Signal output	Signal output	MT53RAix ver. MT53RAsx ver.

**NOTICE**

**The definition of specific interface depends on the device type:**

For example: access voltage of DC ver. is 48V, while AC ver. is 220V

# 3. DEVICE USE

## 3.1 Auto Mode<sup>③</sup>

Remote control device MT53RA, normally works in automatic mode (Auto) and executes the reclosing procedure. 3.1.1 for the working logic.

If you want it to run in automatic mode, perform the following steps:

1. Push the button to Manu mode, the device is in OFF status.
2. Check that the power wiring and communication wiring are correct.
3. Push the button to Auto mode, control close/open by dry contact/ RS485 or by manual close.

### 3.1.1 Working Logic

#### In Auto Mode

- The ON/OFF status can be controlled by the dry contact of the external switch.
- In Auto mode, when the device is connected to the power supply, it is in the OFF status, and the device can be controlled by RS485/dry contact.

#### NOTICE

① The holding time of the ON status is greater than 15 minutes, which is defined as successful close. And then, the reclosing times of the device will be automatically cleared. If the fault trip occurs again, the automatic close will be delayed for 10 seconds.

#### NOTICE

② Auto mode: RS485 ON/OFF and the auto-recloser function are enable. The RS485 communication address and the RS485 baud rate allows reading and writing.

## 3.2 Manu Mode<sup>①</sup>

It is necessary to set the remote control device MT53RA in manual mode (Manu) when debugging on-site. 3.2.1 for the working logic.

If you want it to run in manual mode, perform the following steps:

1. Push the button to Manu mode, the device is in OFF status.
2. Check that the power wiring and communication wiring are correct.

### 3.2.1 Working Logic

- The device is in automatic OFF status. This mode is used for temporary on-site maintenance, which can prevent safety accidents caused by remote power-on.

## 3.3 Lock Mode<sup>②</sup>

Remote control device MT53RA must be in lock mode during long-term maintenance.

If you want it to run in manual mode, perform the following steps:

1. Push the button to Lock mode, the device is in OFF status.
2. At this time, the device must be locked with a safety lock.

### 3.3.1 Working Logic

- The device is OFF and the lock is attached. This mode is used for long-term maintenance away from the switch site to prevent safety accidents caused by misoperation and power-on.

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#### NOTICE

- ① Manu mode: RS485 ON/OFF or dry contact control is not available. The RS485 communication address and the RS485 baud rate allows reading and writing.
- ② Lock mode: it is lockable (aperture 4.5mm).

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# 4. RS485 COMMUNICATION

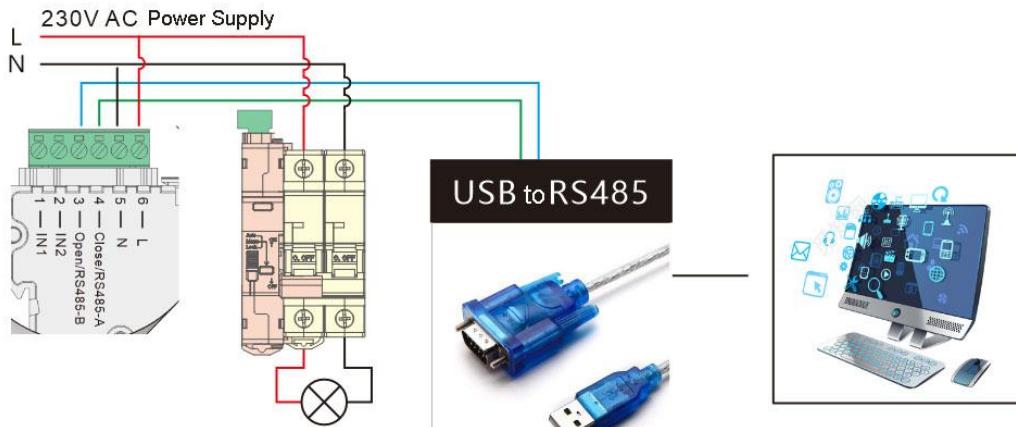
Remote control device MT53RA can be connected by interface port RS485 and Protocol Modbus-RTU.

## 4.1 Communication

The twisted-pair cable with mesh shielding (at least 3 wires) must be used in RS485, and the maximum distance between the MT53RA and the main device is 1200 meters.

Up to 32 MT53RA devices can be connected to this bus.

Use an intelligent RS485 protocol converter to establish communication with a master device.



## 4.2 MODBUS Protocol

In the Modbus protocol, the MT53RA adopts the RTU (Remote Terminal Unit) mode. For the Modbus functions implemented in the device, see "MT53RA Protocol Appendix".

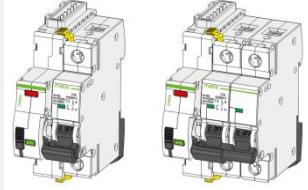
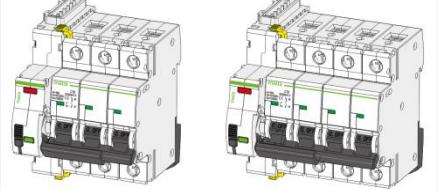
## 4.3 MODBUS Communication Parameter Setting

The prerequisite for the communication between the device and the master station is that the settings of the communication parameters must be accurate. The communication parameters of MT53RA include:

- Communication address: 01 by default, which can be modified by the host computer in the range of 01~247 in decimal.
- Baud rate: 9600 by default, which can be modified by the host computer software.
- Communication parameters can be freely set if necessary.

# 5. TECHNICAL FEATURES

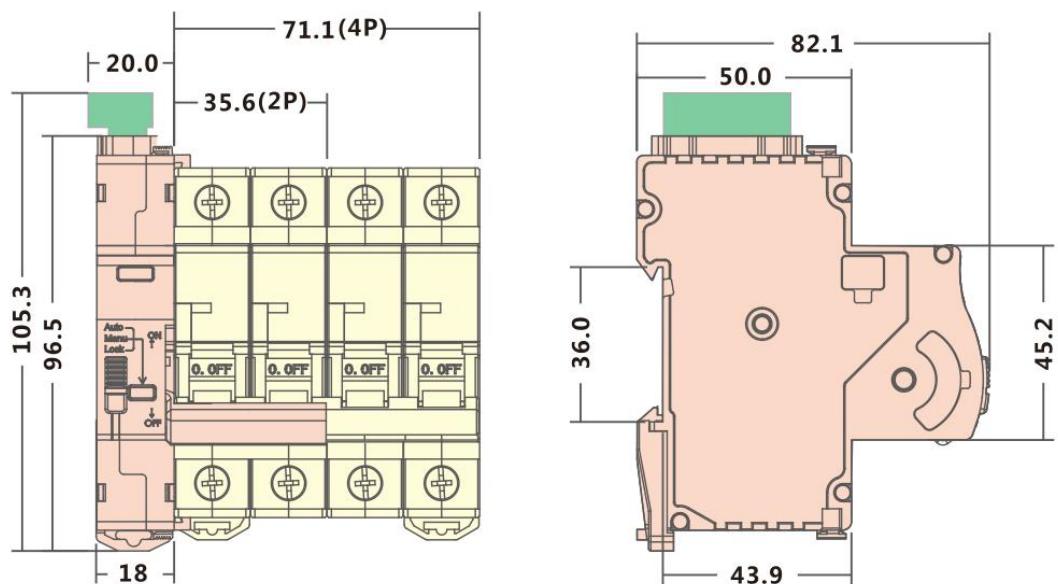
## 5.1 Technical Parameter Table

Picture	 	
Function Description		
Manual/Auto Switch	•	•
OFF Safety Padlock	•	•
ON&OFF Status Indication	•	•
ON&OFF Status Output	MT53RAix ver. MT53RAsx ver.	MT53RAix ver. MT53RAsx ver.
ON/OFF	RS485 control (MT53RAs ver. MT53RAsx ver.)	RS485control (MT53RAs ver. MT53RAsx ver.)
ON/OFF	Dry contact control (MT53RAi ver. MT53RAix ver.)	Dry contact control (MT53RAi ver. MT53RAix ver.)
Poles	1P, 2P	3P, 4P
Electrical Characteristics		
Applicable to Case Current	63A 125A	

of MCB (A)		
Rated Voltage (Un)	AC230V DC48V	
Rated Insulation Voltage(Ui)	300V	
Rated Frequency	50Hz 60Hz	
Standby Power	$\leq 1.2W$	
Consumption		
Mechanical Characteristics		
Open Time	0.1s	
Close Time	0.2s	
Operation Life	20000	
Weight	88g	89g
Module	18mm	18mm
Environment Characteristics		
Operating Temperature	-25°C~+55°C	
Storage Temperature	-35°C~+65°C	
Relative Humidity (non-condensing)	5%-95%	
Highest Altitude	2000 m	
Protection Grade	IP20	
Communication Parameters		
Baud Rate	The default is 9600, and it can be set	
Check Bit	No check	

Data Bit	8
Stop Bit	1
Device Address	Default address 1

## 5.2 Frame Size



# 6. FAQ

Problems	Possible Causes	Solutions
No automatic closing	The recloser function is inhibited in Auto mode.	Activate the reclosing function through the host computer software.
	Setup error of the working mode	Push the button to Auto mode.
	Reclosing failed, and entered logic lock status	Control the close through the host computer software, or manually close once.
Send ON/OFF command but no response	Incorrect setting of safety lock button	Make sure the safety lock button indication in the "Auto" position.
	Abnormal communication line	Check whether the communication cable is disconnected.
The host computer cannot communicate with the device	Incorrect RS485 communication address	Check whether the device address is consistent with the definition
	Incorrect RS485 baud rate	Check whether the device communication rate is consistent with the definition
	The 485 bus is long and does not use terminal adaptation resistors, so the current signal reflection will interfere with the bus.	Check whether the 120 ohm resistor is added

	Communication link is disturbed	Check whether the communication shield is well grounded
	Abnormal communication line	Check whether the communication cable is disconnected

## 7. TECHNICAL SERVICE

Anyone who purchases this remote control device MT53RA enjoys a 24-month warranty period from the date of purchase. During the warranty period, if the quality of the device itself affects the normal use, you can enjoy free repair and replacement, and the condition of paid service as follows: the improper use, drop, installation and wiring errors that cause irreversible damage. Besides, if you disassemble and modify the device yourself, you will not enjoy the warranty service.

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

### **Statement:**

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

Web: [www.matismart.com](http://www.matismart.com)

Email: [matis@matismart.com](mailto:matis@matismart.com)

Phone: +86 21 60503668

Mobile: +86 186 2187 9631

Address: Room 318-320, No. 83, Huanhu West 3rd Road,  
Pudong, Shanghai, China 201306

 matismart SHANGHAI MATIS ELECTRIC CO.,LTD.  
AloT Electric 上海麦豆电气有限公司