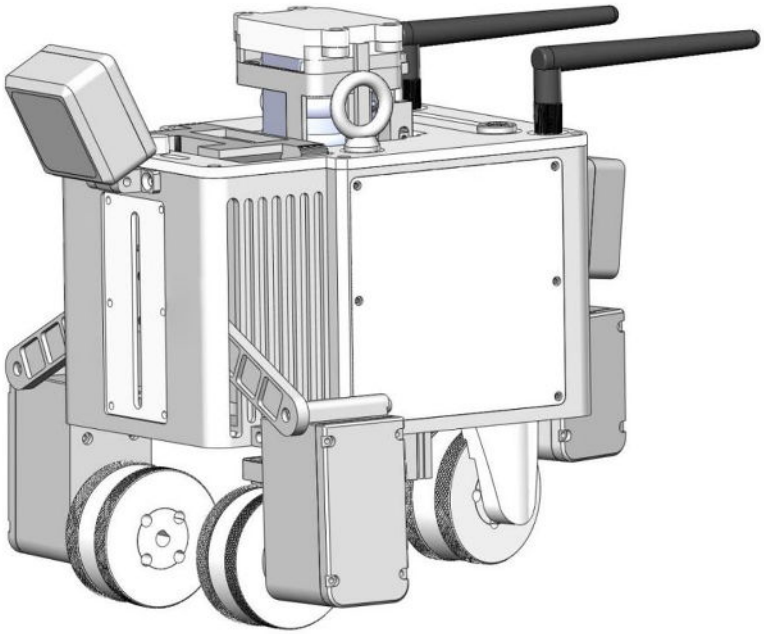
eThick-4000 Generation Three-wheeled Magnetic Stress Robot

Instruction Manual



Anhui Mikrosize Precision Instrument Co.,Ltd

Add: A-4035 RuiFeng Business Expo, Wuhu City, China, 241000.

Web: www.mikrosize.com **Email:** mikrosize@mikrosize.com

Dear users:

Thank you for purchasing this product,this manual can guide you to use this product correctly,To avoid operation Danger or property loss during Operation.Before using this product,Please read the user manual and keep it properly.

About this manual:

This manual is for guidance only.

Photos provided in the brochure,Graphics,Charts,illustrations etc.

For explanatory and illustrative purposes only,Please refer to the actual product.

About the system:

This system involves precision measurement and control of components.The operator should Possess Professional expertise in testing or maintenance,electrical work,instrument and industrial automation.

the operator is Proficient in basic Android system operations

Precautions

To the maximum extent permitted by law,the products described in this manual (including its hardware, software, firmware, etc.)

According to "In its current state " is provided with all faults,errors or failures,and the company does not provide any express warranty or implied warranties.including but not limited to warranties of merchantability,fitness for a particular purpose,and non-infringement of third party rights;

When using this product, please strictly abide by the applicable laws. If this product is used to infringe the rights of a third party The Company assumes no responsibility for any improper use.

When using this system in closed or semi-closed facilities such as pipelines and containers, the equipment must be operated smoothly and pay more attention to Check whether there is any abnormality in the working condition and make corresponding corrections at any time according to the prompts given by the system. The company does not assume any responsibility for the robot overturning or getting stuck.

Notes on this manual

Please keep this manual in the storage box of the equipment so that users can operate it correctly at any time and anywhere.

Please note:This manual is applicable to all specifications, equipment and optional equipment of the automatic intelligent detection system.

You may find that some of the described configurations are missing or redundant in your system.

In this manual,remarks or notes indicate that details and functions may vary depending on the specifications and models.

Contents

Product Main Specifications 1
Brief Description of Features..... 2
2. Battery Cell..... 4
Equipment Installation and Usage..... 5
1. Assembly Connection Diagram..... 5
2. Device Connection..... 5
Basic Operations..... 7
1. Preparation before using the system 7
2. System power on/off..... 7
3. Detection software operation 8
4. Video..... 10
5.Use of demagnetization plate 11
6. Video/photo playback 12
7. Thickness gauge settings 12
8. the robot with Thickness measurement..... 14
Charging Instructions 16
1. Charging the remote control 16
How to use 16
2. Charging the Robot 16
File Copy..... 17
1. U Disk transmission..... 17
2. Data transmission 17
Frequently Asked Questions FAQ 18
Daily Maintenance and Precautions..... 19
1. Daily maintenance..... 19
2. Precautions..... 19
Warranty Card 21
1.Warranty Commitment..... 21
Illustrate: 22
2. The following situations are not covered by the warranty 22

Product Main Specifications

Robot body	Size	(200*230*210) mm
	Travel speed	(0-3)m/min
	Weight	about 5KG
	Main materials	aluminum alloy 6061/ ABS
	Power input	12.6V, 2A
	Battery Type	lithium-ion
	Operation endurance	3h
Camera	Quantity	2
	Physical pixels	200 Ten thousand
	Video recording resolution	10800/720P
	Video recording bit rate	12 Mbps
Remote Control	Picture white	1920 (H) × 1200 (V)
	System Configuration	Android 9.0
	Storage	4G Running memory, 64G Storage
	Charging time	3.5h (30W Fast charging)
	Operation endurance	10h
	Waterproof grade	IP4X
	Working environment temperature	-1050°C
	Battery Type	lithium-ion
	Effective remote control distance	(0-24) KM

Brief Description of Features

The main features of this product:

Ultra-portable design,easy to operate,carry and store

7 inch display,with a maximum brightness of 1000 Nits (cd/m²)

storage and playback technical data

Real-time feedback of robot movement distance

Full-screen touch plus physical button dual-mode operation

Full HD digital image transmission

With wireless remote operation,the effective distance is (0-24) KM

Multi-lens observation of the working conditions around the equipment, multi-channel composite auxiliary light source

Can carry a variety of the host devices,including JZJX1,JZJX2, JZJ4000.Multiple Continuous measurement

Minimum climbing pipe diameter is 50 mm

Built -in high-capacity battery,no external power supply required

Note: Due to version changes, the pictures and configuration attachments in this manual are for reference only.The actual details shall be subject to the contract and the actual product received.

Button Interface Definition

1.Remote Control Button Interface Definition



A1:Control the robot forward and backward.The control direction is up and down swing. The larger the swing amplitude,the faster the robot moves .

A2:Control the robot's steering direction.The control direction is left and right swing.The greater the swing direction,The greater the robot’s steering angle

SA:Control the host to move up and down,Swing the host upward until it reaches its highest position.and swing the host downward until it reaches its lowest position.

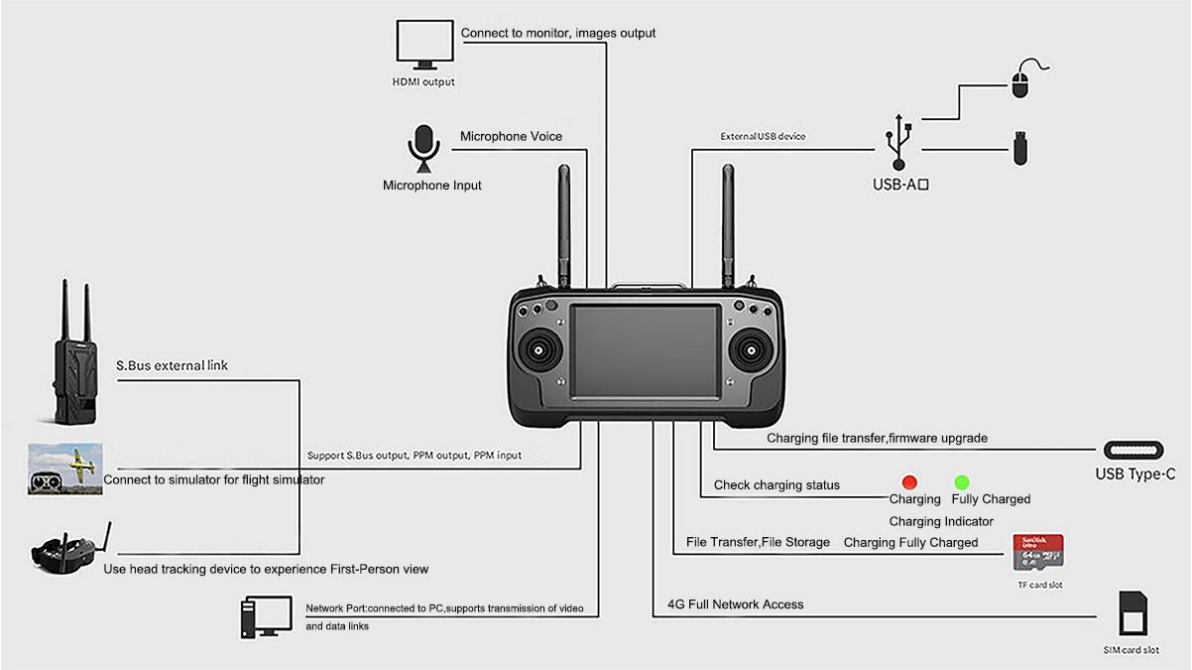
LD1:To adjust the lowest point of the host’s descent:turn the host counter-clockwise to lower it and clockwise to raise it

SD: When the joystick is fully down at the bottom and the SA joystick is also at the bottom,the light turns on. When the joystick is fully up at the top and the SA joystick is

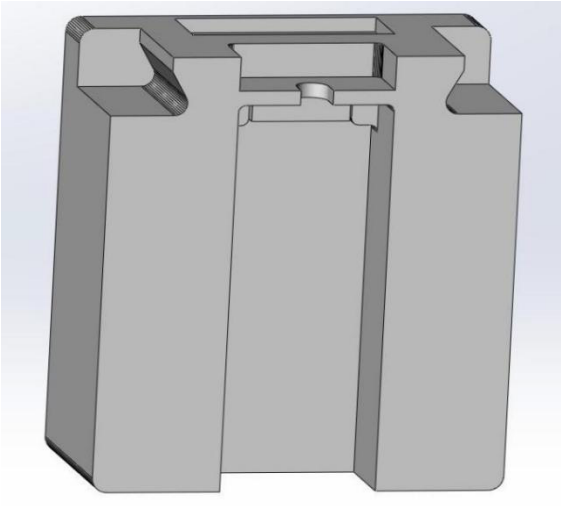
also at the bottom,the light turns off.

Note: To prevent the crawler from falling off, the two magnetic wheels are set to the forward direction by default.

2. Link data flow diagram



2.Battery Cell



Battery charging and discharging are same socket, just plug and unplug

Equipment Installation and Usage

1. Assembly Connection Diagram



2. Device Connection

Remote control connection:Install batteries and cover the battery cover;Connect two receiving antennas,antenna SMA connector must be fully tightened.

The antenna should be positioned perpendicular to the ground, with the control panel facing upward,ensuring that the flat side of the antenna always points toward the aircraft.

The antennas cannot be stacked or crossed.

Please refer to the following diagram:





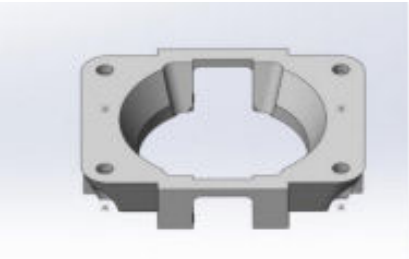
Equipment Installation and Usage

Robot connection:

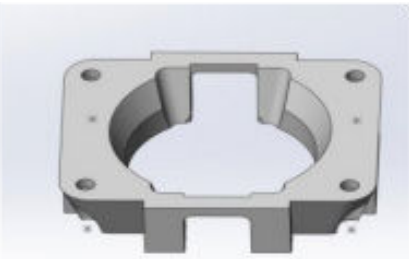
a) Adjust the rear wheel angle and tighten the screws,

then insert the battery;

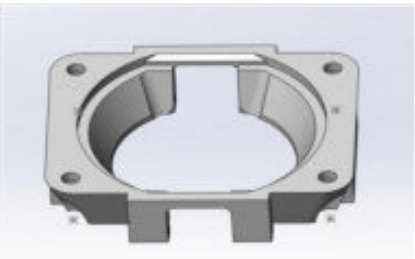
b)According to the host to be carried,select the corresponding fixed bottom cover and cover plate,and Mounted on the lift frame main body.as shown below:



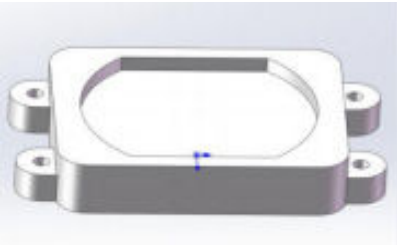
X1 bottom cover



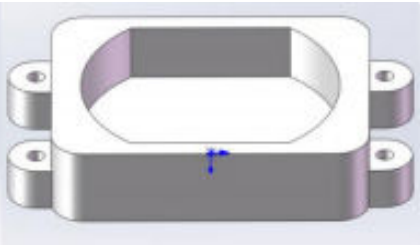
X2 bottom cover



4000 bottom cover



X1 Cover

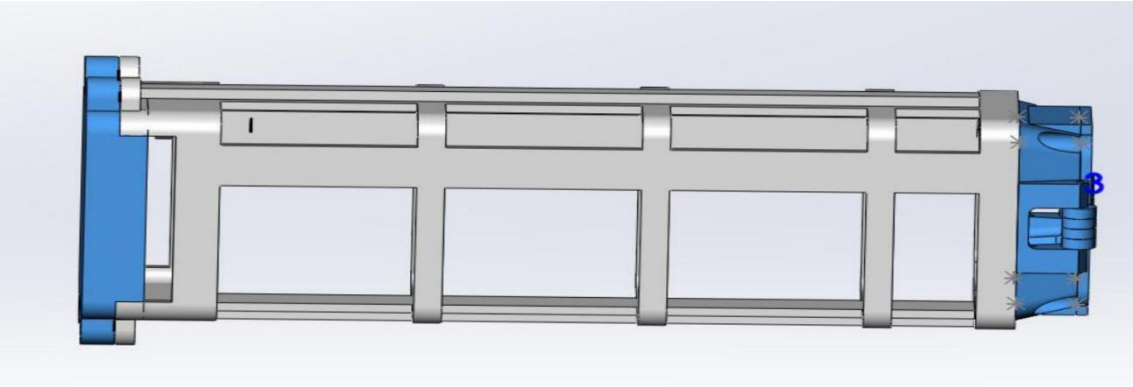


X2 Cover



4000 Cover

The overall assembly drawing is as follows:



Basic Operations

1. Preparation before using the system

Make sure the remote control and robot are fully charged before using the device;

Check whether the connection between the front and rear wheels of the robot is loose or not;

Place the host into the lift frame main body and tighten it.

2. System power on/off

Power on

(turn on the remote controller at first and then the robot):

Step 1:When the device is powered off, short press the power button for about 1 second,the indicator light turns on,then long press the power Key for 2 seconds,then the device can be turned on and enter working state when the screen lights up;

Step 2:Insert the battery into the robot battery slot,press the robot power switch,and wait for the robot to connect to the remote control,duration 1-2 minutes.

Shutdown

(turn off the robot at first and then the remote controller):

Step 1:Press the power switch of the robot and remove the battery;

Step 2:When the device is powered on,press and hold the power button for about 2 seconds.a pop-up window will appear on the system interface.touch Power Off .icon to turn off the ground station power.

Notice:

a) Forced shutdown:When the device is powered on,press and hold the power button for about 8 seconds,the Ground station power supply will be forcibly turned off.

b) Screenshot:When the device is powered on,press and hold the power button for about 2s,a pop-up window will appear on the system interface.touch screenshot icon for

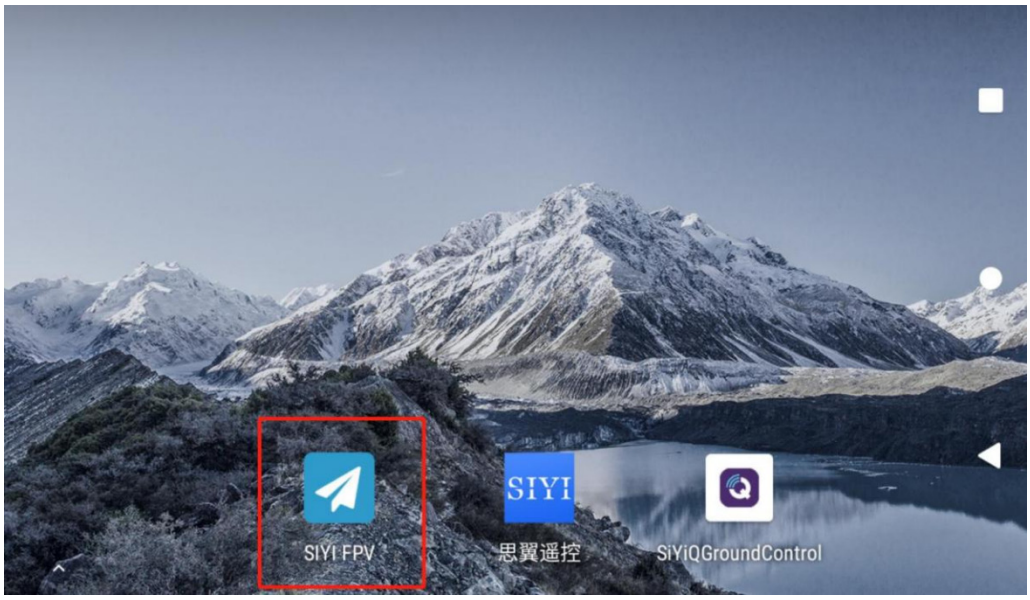
screenshot of the Android system interface.

3. Detection software operation

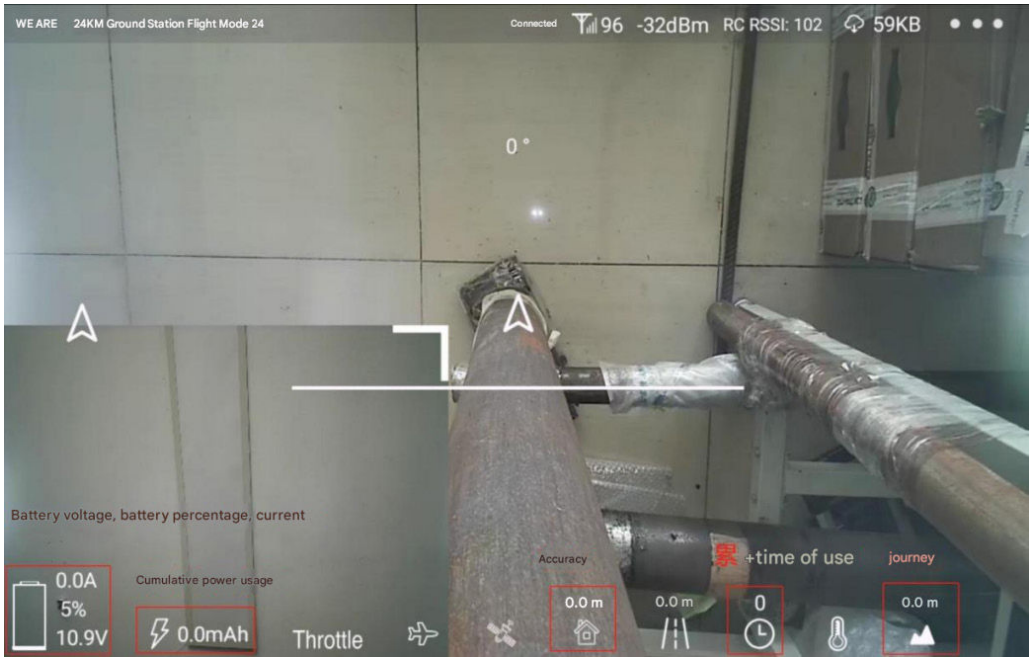
(1) Operation interface

When the device is connected,turn on the remote control and select the icon marked with a red frame in the picture.

System main interface (the display interface is for reference only)



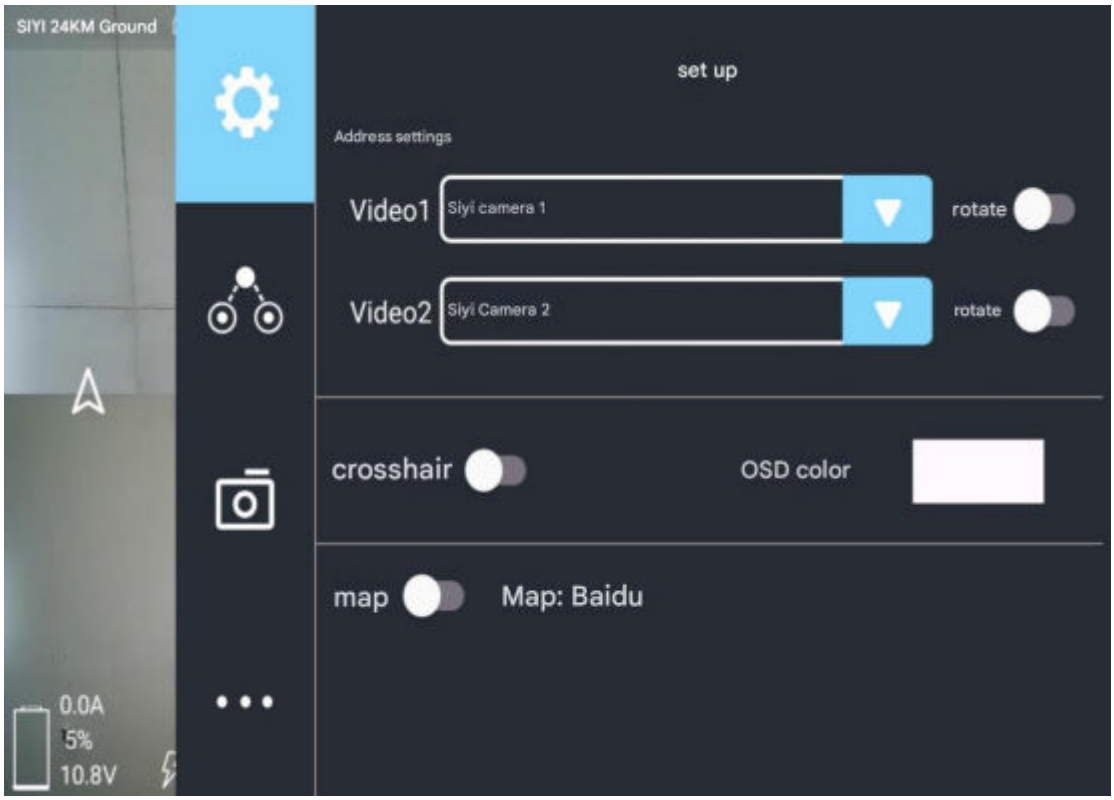
Video detection software interface



Basic Operations

Note: The robot will display the corresponding data during use. Robot return-to-home (RTH) When The voltage is lower than 9V, operate the Robot after Battery is fully charged.

(2)Settings menu



Address settings: Configure Siyi Camera 1 and Siyi Camera 2. You can turn off the image display.the "rotation ” button supports 180-degree flipping of the image.

Crosshair: Enables a crosshair in the center of the image transmission display.

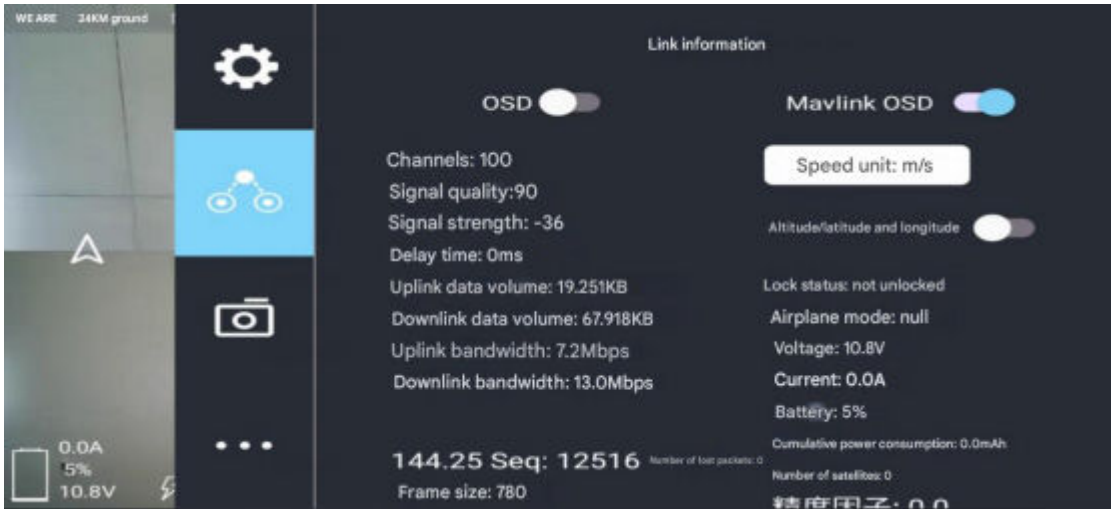
OSD Color: Adjust the font color of OSD information.

Map: Open the flight map in the bottom left of the app.

Map Type:Switch map type (Currently supports Baidu Maps and Google Map

(3) Link information

The Siyi image transmission link information is intuitively displayed on the image transmission screen.



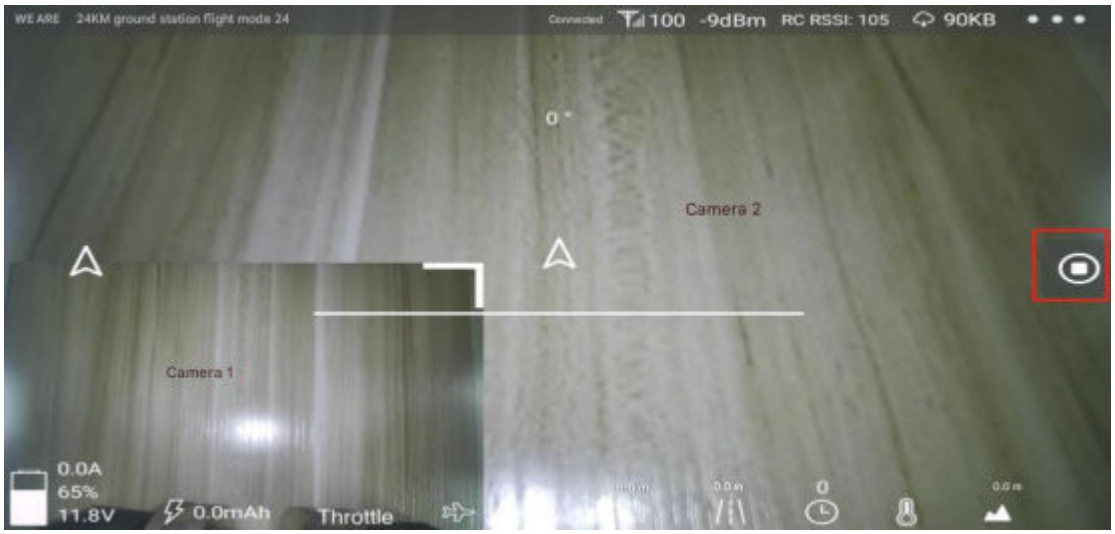
Mavlink OSD: Enable/disable Mavlink OSD information

4. Video

Open the software interface,switch the camera to record,and after the recording is finished,turn off the robot and take out the SD card from camera.view the video on the computer,for detailed steps,see "File Copy ".

Note:1.The video recording software format is 265 Files,it need to be viewed with a dedicated player.It is recommended to use Software "Potplayer ";

2.You need to select the camera to record the video.Two cameras cannot record at the same time.The current maximum page is "Camera 2" which is recording

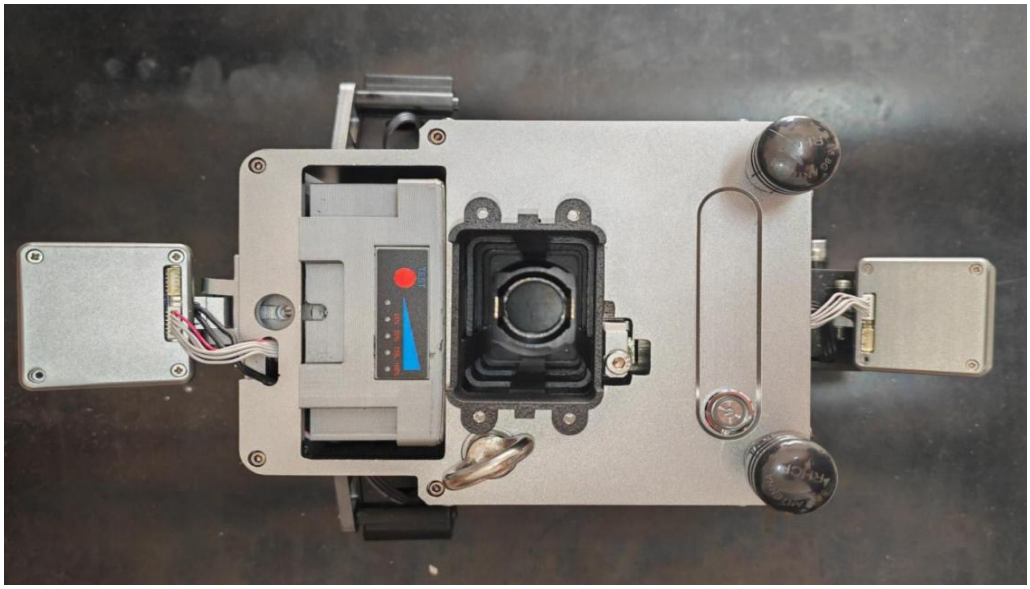


5. Use of demagnetization plate

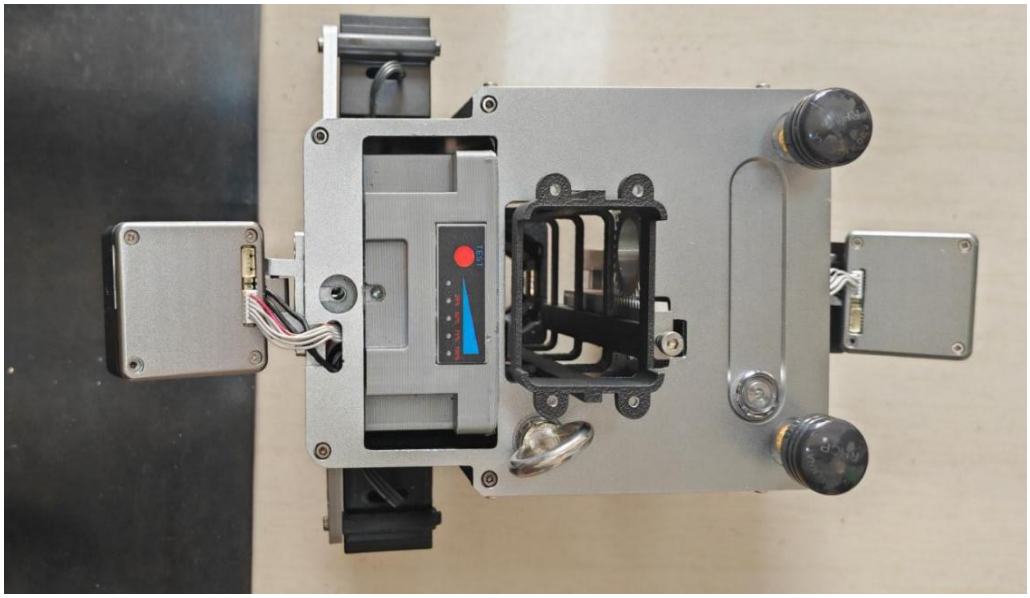
The demagnetizing plate is required to reduce the magnetism when using and storing the robot.Convenient for install and dismantle the robot

(1) Installation

Place the demagnetizing plate on the object to be tested,and then place the robot on the demagnetizing plate.



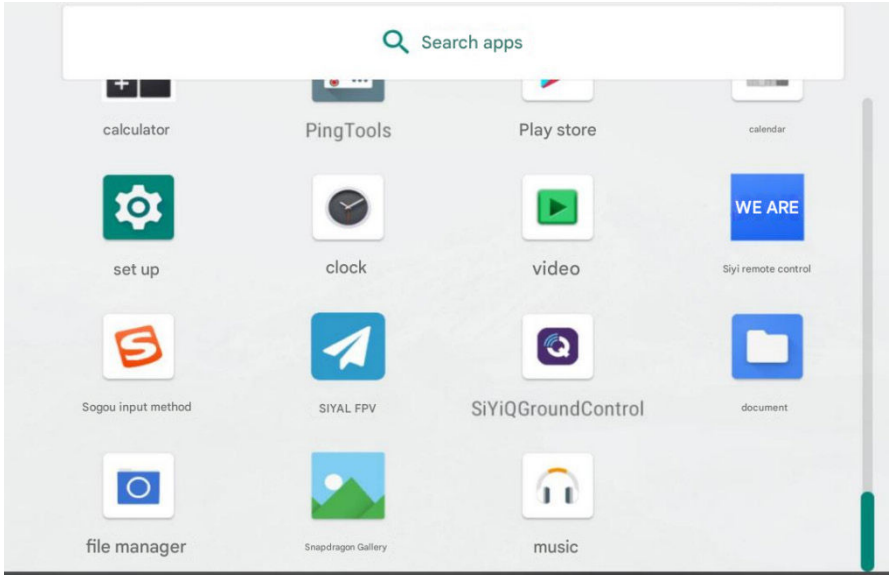
Operate the robot forward or backward,then the robot move autonomously from the demagnetization plate to the object to be measured.



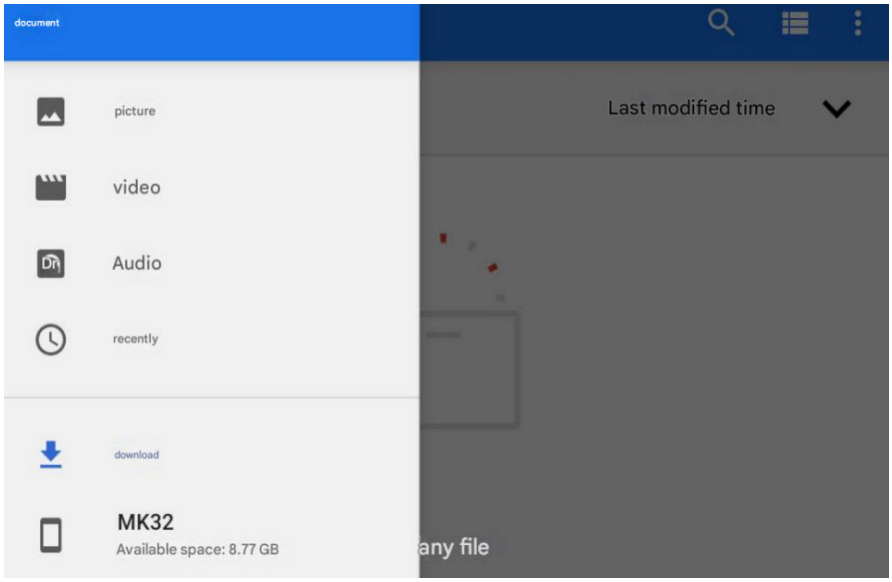
(2) Disassembly:Follow the installation (1) method to let the robot drive to the demagnetization plate,and then lift the whole robot.

6. Video/photo playback

Open "Files" in the app



Click on the top right of the app ” to view



7. Thickness gauge settings

Install the thickness gauge on the robot according to the different thickness gauge host.

Basic Operations

Here we use JZJX1 as an example

(the matching EMAT thickness gauge has a separate instruction manual, please read it carefully before using the instrument).

(1) Turn on the tablet,enter the settings interface,open the hotspot settings, and set the hotspot name to "EMAT_ Host serial number eight-digit code ",the password is set to "lingshengkeji ",turn on the hotspot.As shown in the figure.

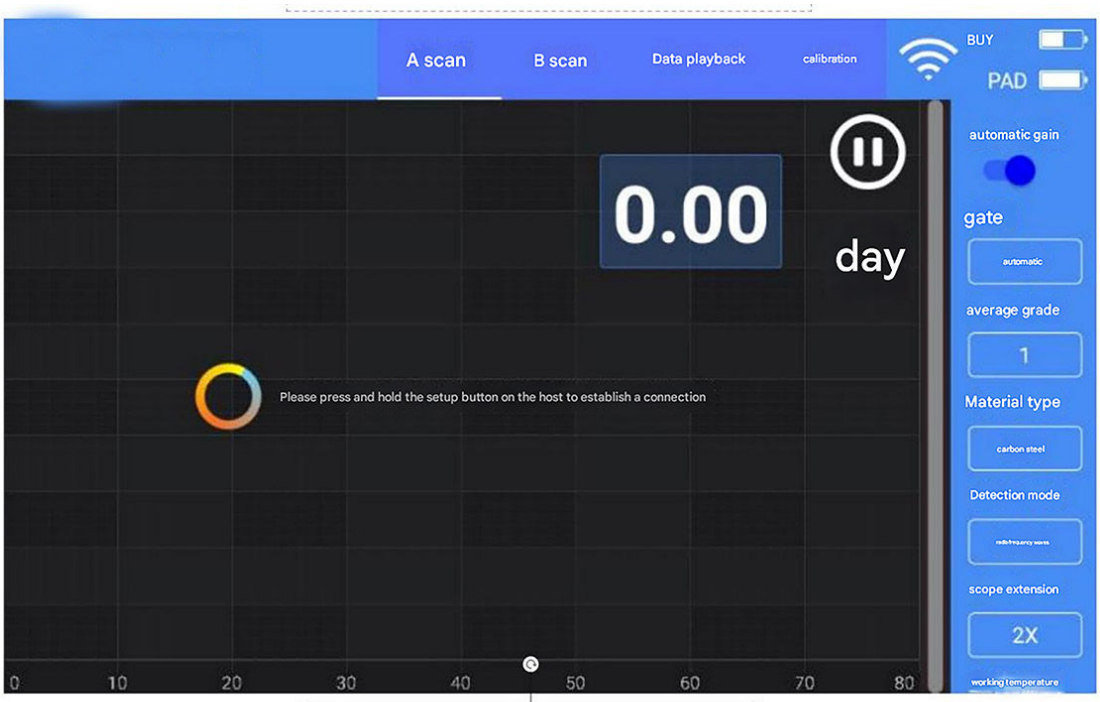


Figure 3: Waiting for Wi-Fi connection interface

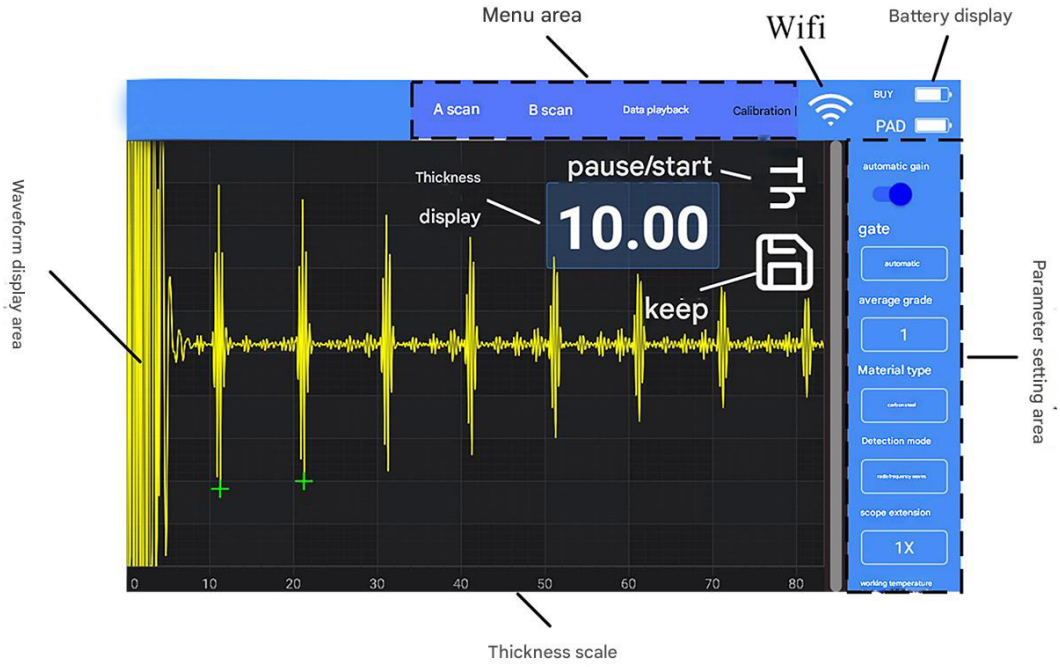
(2)On the main interface of the EMAT thickness gauge,press and hold ⚙ key (about 0.5 Seconds),

The LCD Screen of EMAT Thickness Gauge shows "- " scrolls in a circle, indicating that the host has entered Wi-Fi connection mode.

(3)Wait for a waveform to appear on the APP interface,

which means the connection has been established.

Basic Operations



APP main interface

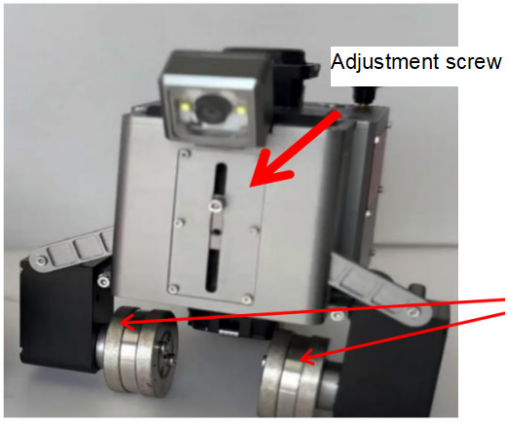
Pen-type electromagnetic ultrasonic high temperature corrosion detection

8. the robot with Thickness measurement

A.After installing and connecting ipad according to the above steps, you can start to adjust the robot based on your need. First,loosen the adjustment screw and adjust the wheelbase according to the diameter of the pipe to be measured so that both wheels point to the center of the pipe to be measured.

manually adjust the wheel track according to the pipe diameter.

(for a flat surface,just Place the wheels horizontally)and tighten the screws.



Basic Operations

Manually adjust the wheelbase according to the pipe diameter

B.After the robot wheelbase is adjusted,

Operate remote control to pull the "SA" --- Lift the lifting frame and move the robot on the object to be measured.

pull "SA" down,Lower the lifting frame and observe the fit between the bottom of the lifting frame and the object being measured.If the condition is not correct,rotate LD1 to adjust the position of the lifting frame so that the lifting frame fits the object being measured.

At the same time,observe IPAD of the thickness gauge.If there are multiple uniform echoes,it means that the fit is good and the adjustment is complete (LD1 needs to be used to adjust the lowest point of the lifting frame when the object being measured changes, such as changing the pipe,crawlling on the elbow etc.).

After the adjustment is completed,the robot begin to do thickness measurement (it is recommended that the lifting frame be in the lifting state when crawling,and then lowered after reaching the thickness measurement point.If B scanning,please pay attention to the flatness of the pipe to avoid damage with the front of the lifting frame).



Charging Instructions

1. Charging the remote control

The MK32 ground station can only be charged by using the factory-provided PD fast charger under powered off condition

How to use

a) Use a Type-C fast charging cable to connect the ground station to the PD fast charging head.

b) If the charging indicator light is solid red, it means charging is in progress.

c) When the charging indicator turns solid green,charging is complete.

Notice:

The ground station cannot be charged by using a 5V adapter. Please use the original fast charging charger.

The handheld ground station cannot be charged while it is powered on.Please make sure the ground station is powered off before charging.

2. Charging the Robot

Simply plug the battery into the charger.

Note: The battery has a short circuit protection function.If it cannot be used,place the battery directly on the charger. The short circuit will be automatically released.

File Copy

There are two ways to copy files:

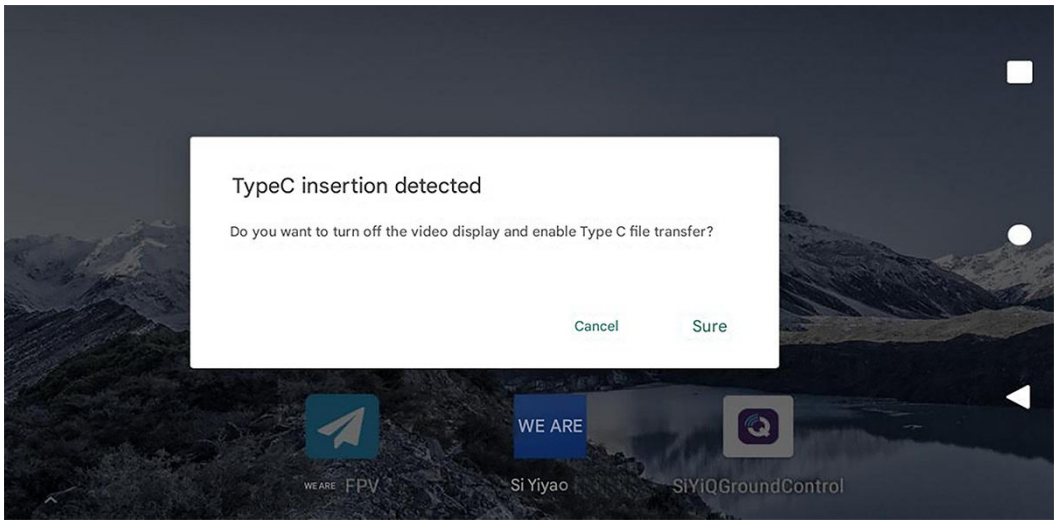
Disk transmission,Data transmission

1. U Disk transmission

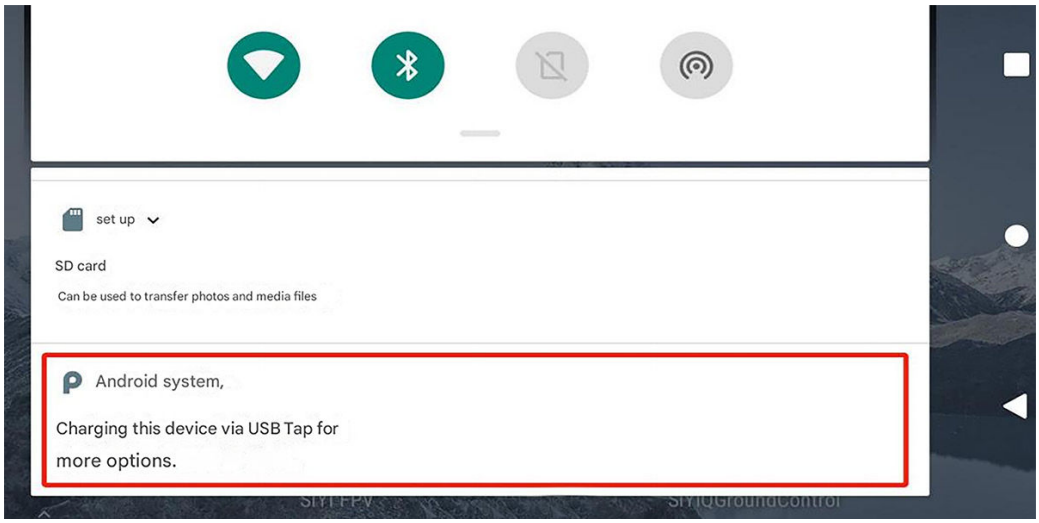
Direct Insert U On the remote control,use the "File ",just copy and paste it.

2. Data transmission

Connect the remote control to the computer with a data cable and USB-C to USB-C cable is OK. After connecting,click OK in the window on the remote control screen;

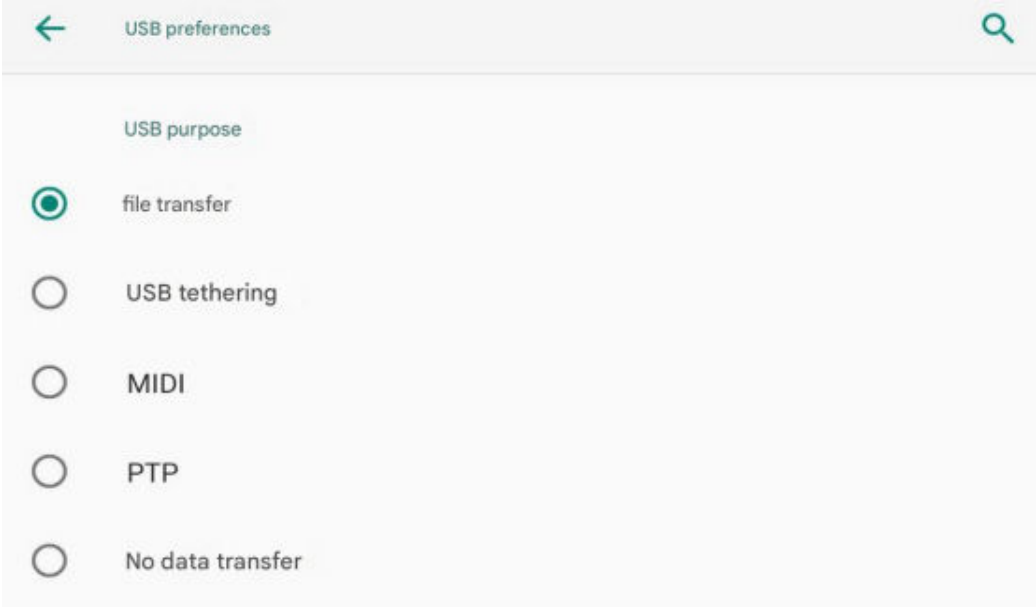


Then slide down the top of the screen to bring up the shortcut window,scroll to the bottom and click the red frame.



File Copy

Select file transfer on the pop-up page and wait 1min,You can transfer files on your computer.



Frequently Asked Questions FAQ

1.Unable to power on:The battery may be out of power. Connect the Screen to the charger and charging it

2. The remote control does not respond:long press the power-on button for more than 8s.The device automatically shuts down,and then restarts.

3. If the touch screen is accidentally touched or has position error,please clean the screen surface with a clean soft cloth, confirm that there is no water stain or oil stain,then continue operation.

4. The copied file cannot be played:When copying files to the disk,the copied files is not completed because improperly removed/ unplugged without ejecting.It needs to be copied again.

5. Unable to store video files:The device storage is full. Please copy important videos and photos,and then Delete unnecessary videos and photos to recover storage space.

6. If there is no video in the software after powering on, please turn off the remote control,make sure the camera is connected properly, and then turn it on again.

Daily Maintenance and Precautions

1. Daily maintenance

(1) After using the device,clean the camera and the host with a soft cloth and water to avoid dirt Corrosion which it will damage the product's performance,do not use paper towels to wipe the camera and screen,avoid hard objects in the paper to scratch the screen.Do not use strong solvents such as alcohol to clean the screen and camera;

(2) When the product is not in use, please put it in the designated packaging box and protect it properly.To extend its service life;

(3) If the connection part of the robot becomes loose, tighten the screws or replace the fallen screws in time;

(4) The robot battery should not be overcharged or over-discharged, and the discharge voltage should not be lower than 9V, the charging

voltage is not higher than 12.6V.

2. Precautions

(1)The Robot has strong magnetic properties.avoiding collision damage to the equipment,Please keep away from magnetic materials as much as possible during operation.

Try not to touch the wheels with your hands unless it is necessary during operation.

(2) This system has precision control circuits, so when using it on site,To reduce the risk during use.please turn it off or keep it away from welding, Powerful blower(PB) and other equipment that can generate strong electromagnetic interference

(3)avoiding damage the male or female connector and poor connection,

During the plug connection,NEVER TWIST PLUG SIDEWAYS

(4) Before using the device,please connect all components firmly and then turn on the

device.Do not plug or unplug the device while it is powered on.

(5) Check the wheels before use.If the center screw is loose, tighten it with a tool before use.

(6) Before storing the device in the instrument Enclosure, please make sure that the controller power is off

(7)Please use the original charger of this product when charging; the charger is only for indoor use and should not be placed In a humid environment, please unplug the charger immediately after charging and keep it properly.

Consumers shall not attempt repair,disassembly or modification of this charger

(8) In order for the battery to achieve optimal performance, the new battery needs to go through several charging and discharging processes

(9)If the equipment is not used for a long time,

it is recommended to Charge the device every two months and then shut it down for storage.

(10)Avoid charging in an unsupervised environment.Do not cover the device and charger during charging.So as not to affect heat dissipation.

(11) When working in an environment below 0°C,the system working time will be shortened accordingly.

(12) It is prohibited to Charge the Robot system when the temperature is lower than 0°C.

(13) Do not place the product in a corrosive or dusty environment for a long time.

(14) Do not expose the product to rain or place the lens in water for a long time .

(15) Do not attempt to disassemble this product by yourself.Repair work is only performed by professionals authorized by the original manufacturer.

(16) Try to avoid collision between the lens and hard objects, otherwise it may cause damage for the hardware of the machine.

Warranty Card

Product Number: _____

Date of manufacture:_____

Product Model:_____

Product Name: _____

Customer Name: _____

Customer Address: _____

Customer Phone: _____

Maintenance time	Maintenance records	Signature

Thank you for purchasing our products.You will enjoy the following services when using our products.

1.Warranty Commitment

It provides 12 months quality warranty,lifetime maintenance service

Illustrate:

The warranty is limited to the product itself.Power cord, connecting wire,protective cover,instrument enclosure,consumables,etc.

Accessories are not covered by the warranty.If these accessories are damaged after purchase within 15 days,it can be replaced free of charge.

Warranty Card

For internal and external batteries is six months.

If the product has any performance problems during the warranty period, please contact our company first to obtain a solution or

Confirm the warranty method.

For products that have been under warranty by our company, the warranty period is still based on the original product.

2. The following situations are not covered by the warranty

Exceeding the warranty period.

The product has been disassembled or repaired by the customer without authorization.

man-made damage, deformation.

Failure caused by installation and use in abnormal environments such as high temperature, high pressure, and humidity .

Damage caused by natural disasters such as lightning strikes, floods, earthquakes, etc.

Illustrate:

products that are not covered by the warranty,our company can provide paid repair services.

The same performance problem will enjoy a free warranty period of three months from the date of repair.

Mikrosize Distributors Worldwide

Coventry,UK /Warsaw,Poland/Burago di Molgora, Italy/Langgöns,Germany/
Madrid, Spain/Istanbul,Turkey/Minsk,Belarus/Moscow , Russia /Sao Paulo, Brazil/
Mexico City ,Mexico/Penang, Malaysia/Bangkok Thailand etc.....



Anhui Mikrosize Precision Instrument Co.,Ltd

Factary Producing Add: NO13 Shuiku Road Shatou, Changan Town, Dongguan, China.
International Trading Office: A-4035 RuiFeng Business Expo , Wuhu City, China.
Web: www.mikrosize.com Email: mikrosize@mikrosize.com