

# ORBITAL ROBOT CAMERA KD-ZP30R Installation instructions

Please read this manual carefully before using the machine and keep it for future reference.



## **Matters needing attention**

When installing the device, read this safety guide carefully and follow the installation instructions strictly. Keep this specification safe for future reference.

Before connecting the switching power supply to the external power supply, check the power supply voltage. Pay attention to the control voltage label of the device and charge the battery with the standard charger.

Use the device in the required temperature and humidity environment. The ambient temperature of the camera ranges from 0 ° C to +40 ° C, and the humidity is less than 90%.

Prevent foreign bodies from entering the equipment and corrosive liquid from splashing on the equipment to prevent danger.

During transportation, storage and installation, heavy weight, violent vibration and immersion should be prevented from damaging the product.

Do not disassemble without permission. The relevant work should be carried out by qualified maintenance personnel.

Use a dry soft cloth to clean the shell. In case of stubborn dirt, use a neutral cleaner to wipe it.

Do not use strong or abrasive cleaners to avoid chafing the shell.

- **Hoisting rail cars after the completion of banning presence on the ground, to prevent the car body fall from causes because of other problems.**
- **Installation needs to pay special attention to support fixed slowdown, lest the insecure fixed body.**

## **Product and service disclaimer**

The information provided in this manual is intended as a guide only. All along, KIND strives to provide correct, complete and appropriate information. However, KIND cannot exclude that some information in this manual may be incorrect or incomplete and that this manual may contain typos, omissions or incorrect information. KIND recommends that you double-check the accuracy of the information in this document, and KIND is not liable for any omissions or errors. Or any subsequent loss or

damage resulting from the information provided in this Description, further information about the contents of this description or the products may be obtained by contacting local offices or KIND Headquarters.

For your safety, please do not let the equipment receive rain or damp. In case of failure, please do not remove the casing. For after-sales matters, contact the manufacturer to ask professional engineers for maintenance.

When recording or transferring important data, be sure to pre-check the device connection or perform a test first to ensure proper operation and avoid data loss

According to copyright law, recorded video or audio may not be used for any purpose other than personal enjoyment without the permission of the copyright holder. Note that for live performances, performances and exhibitions, even your own entertainment may be restricted.

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## —. Product overview

Nowadays, the field of radio and television, new media and campus TV stations have a wide range of intelligent shooting system demand, with the continuous rise of labor costs, the scale of industry demand continues to expand, the serious shortage of technical personnel, automation and intelligent innovation, stable, high standard, high reliable, low cost broadcast grade intelligent shooting system has become a reality, and has a wide market.

The KIND orbital shooting robot system enables the camera crew to obtain excellent shooting angles that are beyond the reach of traditional tripods and flat rail cars, providing a variety of lens materials for the composition of the final program. The translation, lifting, pushing, pulling, rolling, bending and leaning of the camera in the system are all controlled by the servo motor system, which makes the system slow stop, slow start, uniform speed change and silk-smooth. The shooting of the lens is flat, accurate and stable. Meanwhile, the shooting track of the system can be prefabricated, stored and called to realize the intelligent pairing and combination with the scene, so that the shooting staff can be more calm in the shooting, reduce the labor intensity and reduce the dependence on more professionals.

## 二. Component introduction

The KIND orbital shooting robot system is composed of six parts: the shooting track system, the shooting lifting system, the power supply and battery system, the camera system, the precision and intelligent shooting control system, and the wireless audio-visual transmission system.

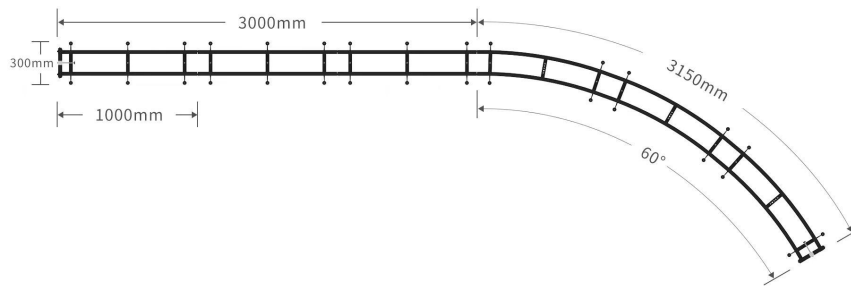


- ①Camera track system.
- ②Camera lifting system.
- ③Power supply and battery system.
- ④Camera system.
- ⑤Precision intelligent shooting control system.
- ⑥Wireless audio and visual transmission system.



## 1. Take pictures of the track system: slides and slides.

**Shooting slide rail:** The shooting track is made of open mold and CNC CNC finishing molding, the surface has been ground for many times, smooth and smooth, stainless steel bullet seamless butt, track size: 100cm x 18cm x 5cm, straight rail and curved rail, can be combined according to the shooting needs, support the roof hanging or portable formal installation.



Curved rail



Straight rail



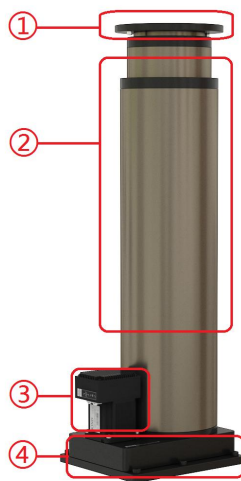
The parts of a pulley.

**Wheelbarrow:** CNC refined rail car, 4×1 wheel silent rail wheel, the use of fully closed design of large torque servo motor to do rail car power, synchronous belt transmission, compact structure silent, easy installation, storage and convenient carrying. The fastest **1000mm/s**, the minimum **1mm/s**, speed and track remote control adjustment, support stepless speed regulation; DC 48V power supply; Maximum payload: 30kg; Unloaded weight of the slide: 5kg; 200W servo motor control system, support 2.4G wireless remote control, control distance up to 100 meters.

## 2. Photograph the lifting system

The shooting lifting system adopts three precision two-stage ball screw electric cylinders, each pipe diameter size is: Ø145mm-Ø125mm-Ø105mm; Initial  $\leq 700\text{mm}$ , travel 800mm, start, brake and travel without any shaking. Repeated positioning accuracy  $\pm 0.01\text{mm}$ , rated thrust 0.42KN,

programmed positioning, integrated control. Speed 200mm/s to 0.1mm/s (servo motor control stepless speed regulation), programmable control of precision servo motor driven electric lift, quiet and stable operation, can be convenient to adjust or preset the height of the machine.



①flange.

②Lifting rod.

③Motor.

④Drive case.

### 3. Power supply and battery system

The camera system, track system and lifting system are powered by lithium battery. The lithium battery is powered by 14.4/28.8V 290Wh 250w

V-port battery, and the dual battery power supply is automatically changed. The built-in DC-DC power system realizes the output of multiple DC power supplies, which can supply 12V for the camera system and 48V for the lifting system. Rail car system power supply 48V.

	magnet
	battery

## 4. Camera system



①、 ADDR: Control camera address (0 is 1,1 is 2, and so on).

②、 485 Control: Controls camera lens direction and focal length through the 485 port.

③ 、 HDMI output: video output, connected to audio and video transmission equipment for picture transmission.

④、 12V power port: supplies power for the wireless audio and visual transmission system.

The system adopts two kinds of broadcasting camera **KD-C25UH** and **KD-C1000UH** of KIND, and the two kinds of cameras are customized in terms of internal power supply structure, wireless control and wireless video transmission.

## 5. Precision intelligent shooting control system.

### **Precision intelligent shooting control system specifications:**

**Double lever:** Broadcast level double rocker control keyboard, respectively control the camera PTZ, the shooting system horizontal advance and fall, to achieve 5 dimensional control.

**Camera setup:** Camera menu and various Settings, automatic or manual shutter, focus, aperture, white balance and other functions.

**Rail car control:** Different starting points, ending points and limit points can be set according to the application to prevent the wrong operation resulting in the slide out of the track, the system supports the fault resulting in safe setting, within the limit point to safely control the rail car forward, backward, acceleration and deceleration, fixed-speed cruise, prefabricated track, start and stop soft and smooth.

**Electric cylinder control:** Control cylinder rise and fall, as well as speed and direction.

**Preset trajectory:** The lifting system, translation system and camera PTZ system control constitute an integrated multi-axis synchronous automatic shooting system, which can realize multi-axis repeated trajectory shooting. And can adjust the speed and change the direction, adjust, set, record, call shooting preset bit. Set up, optimize, store, and invoke prefabricated multishot tracks.

**Automatic cruise shooting:** Built-in 9 sets of shooting track storage and call keys, so that the lens multi-dimensional translation, lift, push, pull, roll, tilt, tilt, flat, steady, accurate in accordance with the preset trajectory of multiple groups of motion track shooting images automatically presented to the user, realize intelligent shooting, 9 sets of 5-dimensional shooting track recording, storage and call, each group can store 244 control instructions.



①: Record the track of the rail car and camera. The indicator light is on to start recording, and the indicator light is off to stop recording.



- ②: Play and record the track of the rail car and camera. When the indicator light is on, play begins. When the indicator light is off, play is finished.
- ③: Start or stop all camera recording.
- ④: The current camera is recording.
- ⑤: Stop recording the current camera.
- ⑥: The location of the camera can be connected to 10 groups of cameras simultaneously.
- ⑦: Control rail car forward, backward and lift functions.
- ⑧: The display displays the status and memory capacity of the NDI camera.
- ⑨: The preset bits of the camera can be used to quickly return the camera to the preset position. There are 9 sets available.
- ⑩: (SET) Confirm key of the camera preset point. After adjusting the camera position, press this key to confirm the setting.
- ⑪: (FAST/SLOW) Adjust the speed of the camera and the rail car so that the indicator light comes on fast and the indicator light goes off slowly.
- ⑫: (FOCUS AUTO) The indicator light can automatically adjust the focal length of the camera.

- ⑬: (IRIS PRI) Indicator light, aperture priority.
- ⑭: (SHUTTER PRI) Indicator light, shutter priority.
- ⑮: (WB AUTO) Indicator light, automatically adjust the white balance.
- ⑯: (ONE PUSH) One key adjustment white balance.
- ⑰: (IRIS) Manually adjust the aperture by turning the knob to adjust the aperture.
- ⑱: (SHUTTER) Adjust the shutter manually. You can adjust the shutter through the knob.
- ⑲: (FOCUS) Manually adjust the focus, you can use the knob to adjust the focus.
- ⑳: PTZ controls the left, right, altitude, and elevation of the camera as well as the focal length of the camera (the focal length of the camera can be adjusted by rotating the rocker).

**Note: ⑫ ⑬ ⑭ ⑰ ⑱ ⑲ is automatic and manual respectively, in automatic mode, manual knob cannot be used.**



(1): (AB) The 485 port of the terminal connects to the camera and controls the camera independently.

(2): (TRG) 232 interface of the terminal. TR sends and receives, and G is grounded. The camera can be connected through 232 interface to control the camera independently.

(3): Type B USB interface connected to the virtual recording and broadcasting device, you can view the real-time track of the rail car on the software.

(4): Connect the 12V power port to the DC. Do not connect the 12V power port to the DC.

(5): The 2.4G antenna can enhance the control signal of the rail car.

(6): The 433M antenna can enhance the camera's control signal.

**Main function:** Record/play video track, control camera and rail car forward, backward, push, pull, roll, shift and focus.

**Camera control:** It can control camera push, pull, roll, tilt, tilt, and camera Settings, such as white balance, automatic white balance, one-button white balance, manual focus, shutter manual adjustment, aperture manual adjustment and menu operation, and can control camera zoom, focus, aperture, recording and other functions.

**Rail car control :** Control rail car forward, backward, acceleration and deceleration, track cruise, preset position, start and stop soft and smooth.

**Lift control:** Control lift ascent and descent, speed and direction.

**Preset trajectory:** The lifting system, the sliding track pulley system and the camera PTZ system control constitute a set of integrated multi-axis synchronous automatic shooting system, which can realize the multi-axis repeated track shooting. And adjustable speed and direction change. It can realize multi axis synchronous automatic control of head, rail car and lifting system. The built-in encoder of the servo motor can accurately record the running position of the rail car. Based on this, two virtual starting and ending points can be set for the rail car on the control platform. No matter acceleration and deceleration, constant speed cruise or course switching,

the rail car can operate within a safe range between the two points to realize automatic cruise shooting.

## 6. Wireless audio and visual transmission and real-time wireless control system.



**Wirelessly transmit HD 1080p camera images to the monitor.**

**High-performance, powerful remote signals are transmitted through walls, floors, and ceilings up to 100 feet (maximum range can be achieved with streaming sight lines).**

**Easily send clear, uncompressed HD video and digital audio. Even when transmitting 3D video streams to 1080p devices, the signal is lag-free (real-time).**

The easy to install plug-and-play setup eliminates the need to install expensive, inconvenient cables. No software or WIFI connection required. Receiver: 1xHDMI output.



**Note: The wireless audio-visual transmission and real-time wireless control system is divided into sending end and receiving end, please pay attention to the distinction.**

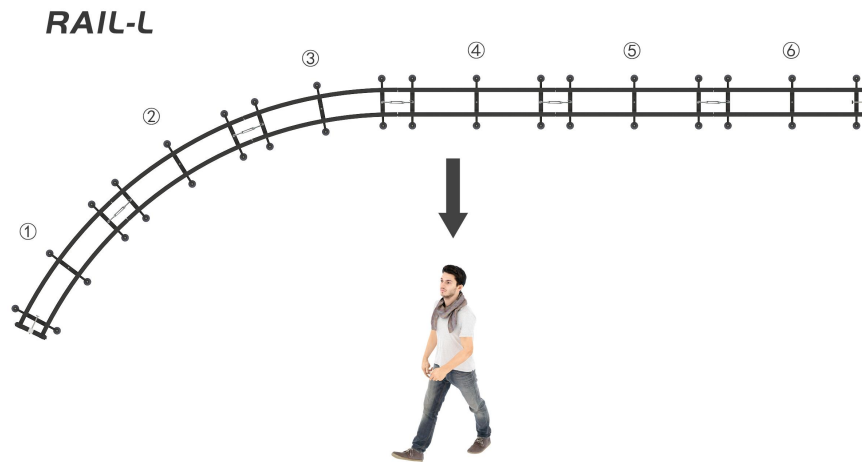
Introduction to the wireless audio and visual transmission interface.

- ①USB: de bugging port
- ②HDMI OUT 1:HDMI output 1
- ③HDMI OUT 2:HDMI output 2
- ④OFF/ON: Equipment power switch
- ⑤7-17V: Power interface

- ⑥RX: Receiving end
- ⑦7-17V: Power interface
- ⑧OFF/ON: Equipment power switch
- ⑨HDMI LOOP: Video loop out
- ⑩HDMI IN:HDMI input
- ⑪USB: Debugging port
- ⑫TX: sender

### 三. Installation instructions

#### 1、Track installation



Rail 1	Rail 2	Rail 3	Rail 4	Rail 5	Rail 6
1	1	1	1	1	1
Support bracket	Reduction bracket	Lock nut	Supporting foot	Hoisting nut	Hook
18	2	36	36	36	5

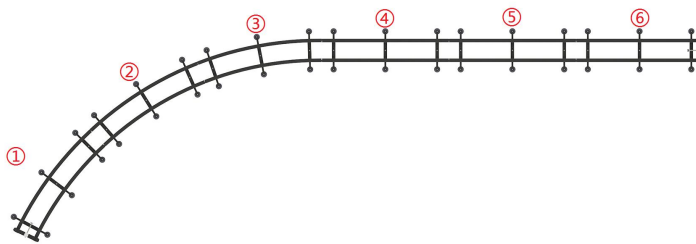
Rail car components



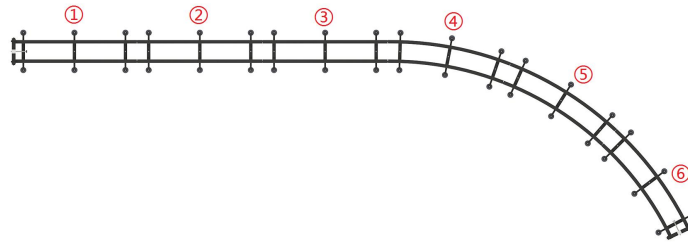


Installation effect

First determine the starting point of the track, the end point, according to the track number to determine the position of each section of track.



**Track starting point (a rail car starting from a curve)**



## Track starting point (rail car starting in a straight line)



**Each track has a label, please install it in sequence (label position is shown in the figure).**

### Ground installation:

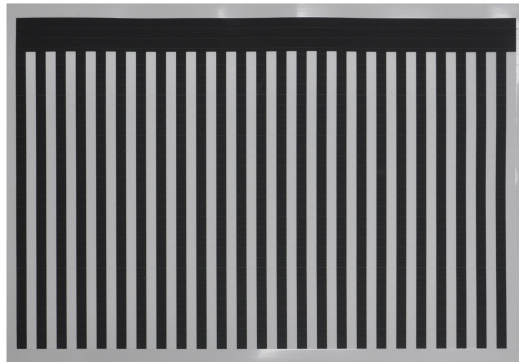
- (1) Install the supporting feet on the supporting bracket, with two supporting feet for each bracket. The depth of each support foot into the mounting bracket should be consistent, so as to facilitate subsequent adjustment of the level.

- (2) Install the support bracket on the track, and install 3 groups of support brackets for each track.
- (3) The track installation numbers are connected end to end, and the joints are fixed with a pull horse.
- (4) Adjust the height of the supporting feet to keep all the tracks level.
- (5) Lock the locking nut on the support foot.

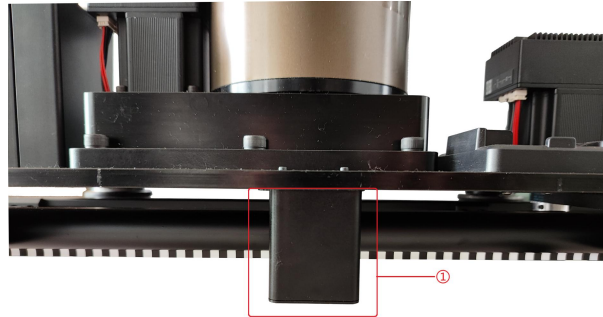
## Ceiling installation.

- (1) Install the boom. The position of the boom and the height of the boom are required to be accurate.
- (2) Install the support bracket on the track, and install 3 groups of support brackets for each track.
- (3) The track installation number shall be installed in the corresponding position and fixed on the boom through the hoisting nut. The adjacent 2 sections of the track are locked by the pull, and the level of the track is adjusted by adjusting the supporting feet.
- (4) Lock the locking screw on the hoisting nut.

**Note: Attach horizontal position sensing stickers. Note the direction, the junction. The first half of the first track and the second half of the last track are plastered with pure black stickers. The rest are plastered with black and white stickers. After the hoisting is completed, no one is allowed to stay on the ground of the rail car to prevent the rail car from falling down due to other problems.**



**The above is the sensor sticker, which is affixed to the track on the side of the sensor, as shown in the figure below. The color of the sensor sticker at the stitching of each track cannot be the same, and it should be black and white.**

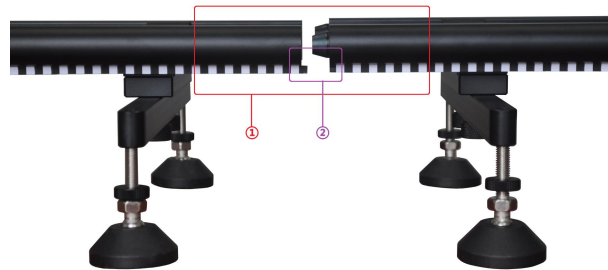


**The first half and the second half of the first and last two tracks need to be pasted with all-black stickers as shown in the figure below.**



**The track shown in the figure above is the first track, where ① is the induction sticker and ② is black and white. The last track is the**

opposite, and the induction sticker is all black in the last half, as shown in Figure 3 and 4.



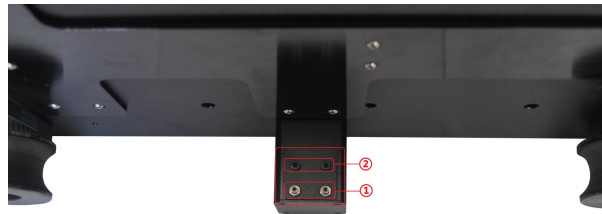
Special attention should be paid to pasting induction stickers. As shown in ① at the connection of each two sections of track, induction stickers must be black and white, and the distance error between black and white should not exceed 2mm.

As shown in the figure below, the effect picture of induction stickers after the two tracks are connected.



## Sensor position selection:

**Note: Do not loosen the screws fixing the sensor as shown in Figure (1). When commissioning and hoisting the sensor, loosen the screws in position (2) to adjust the position of the sensor. The iron plate fixing the sensor can be moved up and down. As shown in the picture.**

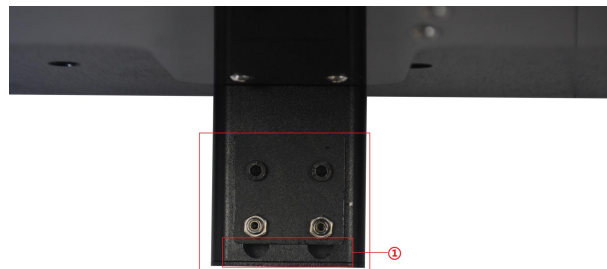


**① Position is a sensor, do not disassemble here**

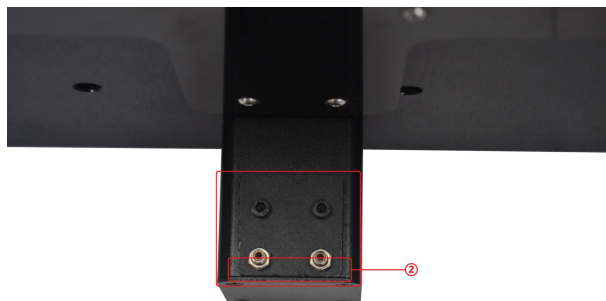
**Position No. ② is fixed sensor iron sheet, formal installation or hoisting can loosen the screws in this position for debugging**

## Commissioning methods for formal and hoisting sensors :

As shown in the following figure, the sensor iron plate is far away from the boundary after the device is installed;



As shown in the following figure: After hoisting the device, the sensor iron plate is close to the boundary;





## 2、 Body mounting



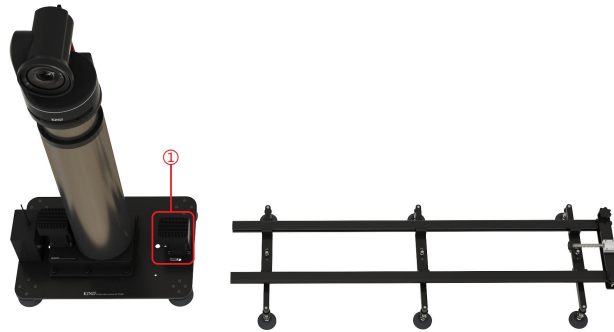
①Rail car motor interface.

②Lifting system interface.

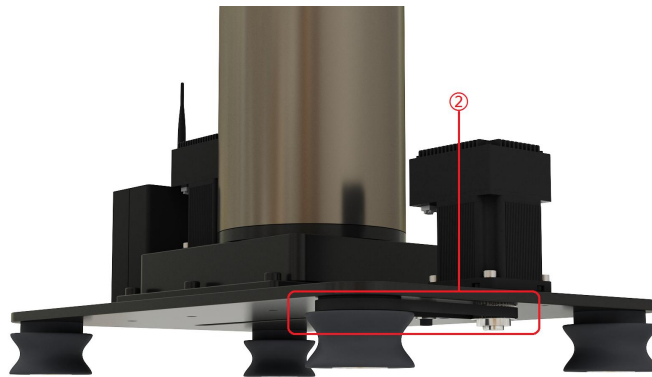
③Battery/power supply system location.

④ Installation position of silent rail wheel (there is one silent rail wheel at each of the four corners).

The car body slides into the track from the start of the track. Pay attention to the direction of the body. The traction motor of the car body is in the front (the end direction) and the controller is in the back (the start direction).



**In the figure above, a section of orbit is taken as an example, starting point and ending point are from left to right.**

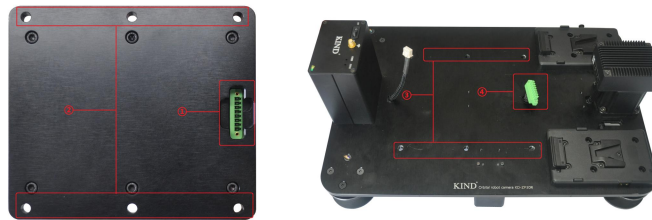


The rail car installation direction, ① is the position of the motor, the motor corresponding to the bottom of the ② position is the driving belt azimuth is in front.

### 3、 Lifting rod installation

Gently place the lifting lever on the slide, align the 6 fixing holes with the corresponding holes on the vehicle, plug IN the camera control cable (the interface is at the bottom of the lifting lever, slightly tilt the

lifting lever, install the control cable by hand through the bottom gap.  
(Select the IN interface for the motor interface), plug in the motor control cable. Lock 6 set screws.



① ④connection, ②and③Is the screw position.



**Pre-installation rendering**

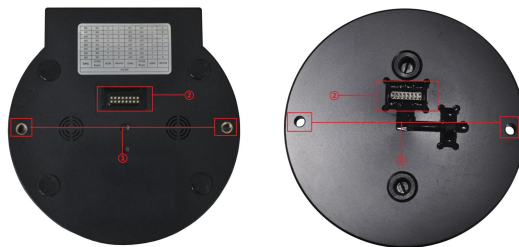


**The effect drawing is installed**

**Note: Six sets of screws are needed to fix the lifting rod. The picture shows three sets, and the remaining three sets are in corresponding positions.**

## 4. Camera installation

Place the camera on the lifting rod platform. The contacts at the bottom of the camera correspond to the spring contacts on the lifting rod platform. Secure the camera to the lifting rod using two 1/4 inch screws.



## Set screw position

In the figure above, ① the position of the lifting system and the fixing screws for the camera, ② the contact point between the camera and the lifting rod.

## 5、 Battery installation and removal

### **Battery installation Procedure:**

After taking out the battery, the magnet is located as shown in the figure below.



Install the special magnet in a specific area of the battery, as shown in Figure 1 below. After the magnet is installed, the red light on the battery will light up, indicating that the battery is in 28.2V output mode, as shown in Figure 2 below.

Install the battery on the battery socket. The battery is installed.



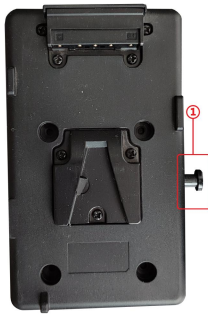
**Figure 1 shows the position of the magnet.**



**For the correct installation after the effect drawing.**

## Battery removal Procedure:

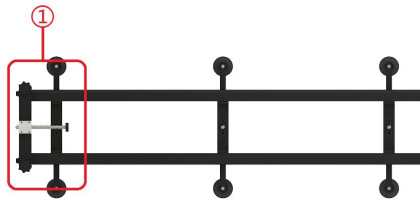
There is a button on the battery holder as shown in Figure 1 below.  
Press the button and remove the battery.



**Note: If the battery cannot be removed, do not remove it with excessive force to avoid damage to the device and battery.**

## 6、 Installation of reduction bracket

Install the deceleration bracket on both sides of the head and tail, and pay attention to the position of the spring inward, as shown in Figure 1



**Note: During installation, special attention should be paid to fixing the deceleration bracket, so as not to cause the rail car to run out of the track.**



## 7、 Installation of wireless audio - visual transmission and real-time wireless control system



After installation, as shown in the figure

(1) Complete the installation of the wireless audio-visual transmission module at the transmitting end, as shown in the figure below. The fixed screws are one long and one short six-edge screws. The long screws are used to fix the camera and the short screws are used to fix the wireless audio-visual transmission equipment.



② Connect the 12V power supply of the camera to the power port at the transmitter, and connect the HDMI input port to the wireless audio and visual transmission device, as shown in the following figure



① is connected with ④, ② is connected with ③.

③The HDMI output on the receiver is connected to the display.

④After the connection is complete, access the power supply and turn on the switch of the receiving end and the sending end.

## 四. Debugging instruction

**Note: When the ORBITAL ROBOT CAMERA KD-ZP30R device starts the self-test after the camera system finishes the self-test, the vehicle body starts the self-test, and the vehicle body looks for the starting point and the ending point of the track (the starting point and the ending point are about 5cm away from the all-black induction sticker). After the self-test is completed, if the preset point 1 is not set, the vehicle will stay in place. If preset position No. 1 is set, then the rail car will stop at preset position No. 1 after the self-check**

### 1. Position sensor debugging

Push the railcar to the end of the track. Turn on the power switch of the rail car and confirm that 2 red light spots from the position sensor fall on the induction sticker. The rail car performs the self-check procedure and slowly walks to the start of the track. Make sure that the yellow lights on both sides of the sensor flash at a fixed frequency while the car is moving. If the sensor does not blink or the flashing frequency is unstable or the rail car stops halfway, the sensor should be adjusted and the sensor sticker should be checked.

If the red light from the sensor does not fall on the sensor sticker, check the sensor installation height. If the yellow indicator light of the sensor does not flicker when the car is moving, first check whether the induction sticker is correctly pasted, slowly push the rail car, respectively make two red light spots fall in the black grid, confirm that the sensor yellow light is off, respectively make two red light spots fall in the white grid, confirm that the sensor yellow light is on. If the above two states are not correct, it is necessary to adjust the adjustment knob on the sensor, clockwise rotation to enhance sensitivity, counterclockwise rotation to reduce sensitivity. Under normal circumstances no need to adjust the sensor knob, factory has given the optimal sensing effect.

## **2. PTZ, advance and fall test**

Turn on the power of the rail car to confirm the successful self-test of the rail car, turn on the power of the intelligent shooting controller, operate the three-dimensional rocker and observe whether the camera can make corresponding PTZ action. Operate the other rocker, and observe whether the rail car and the lifting rod can make forward, backward, and up and down movements.

### 3. Image transmission test

Connect the HDMI output of the wireless AV transmitter to a display device and power it on to verify that the wireless AV transmitter can receive images correctly. If there is a Mosaic on the image, make sure that the distance between the camera and the wireless AV transmitter is within the effective transmission distance and that there is no barrier. The wireless AV transmitter can be placed high. If there is still a Mosaic you can disconnect and restart the wireless AV transmitter to automatically find a channel without interference.

### 4. 485 debugging

As shown in the picture below

SWITCH							
Number	ADDR	Ceiling Mount	TRACE	Number	ADDR	Ceiling Mount	TRACE
0	1	OFF	OFF	8	1	ON	OFF
1	2	OFF	OFF	9	2	ON	OFF
2	3	OFF	OFF	A	3	ON	OFF
3	4	OFF	OFF	B	4	ON	OFF
4	5	OFF	OFF	C	5	ON	OFF
5	6	OFF	OFF	D	6	ON	OFF
6	1	OFF	ON	E	1	ON	OFF
7	2	OFF	ON	F	2	ON	OFF

## 五. Packing list

Straight rail \*3

Curved rail \*3

Support bracket \*18

Short hand screw \*36

Support foot (ground mount)\*36

Lifting screws (ceiling mounting)\*36

Rail car \*1

Lifting rod (including fixing screws)\*1

Camera (including fixing screws and remote control) \*1

Precision intelligent controller and power adapter \*1

Wireless audio and video transmitter and power adapter \*1

Battery (optional)\*2

Induction sticker \*3

Matching wrench \*2

level \*1

6mmscrewdriver\*1

Video and audio pendant \*1

## 六. After-sales service

Dear users, in order to ensure that you fully enjoy the quality service, please carefully read the following product service regulations.

### **The company provides limited warranty and lifetime repair service.**

1. The warranty period is 12 months from the date of sale. During the limited warranty period, you will enjoy free warranty service for product faults, which will be repaired by users or sent to the company (faults caused by improper use, human failure or irresistible causes are not covered by the warranty).
2. In more than 12 months of limited warranty period, the product failure to implement paid lifetime maintenance service.

### **Maintenance response time.**

1. Users will send products to the company from the date, 24 hours response service, switchboard telephone: +86 010-58732647.
2. Before the user sends the product back to our company, please contact the relevant technical personnel of our company in advance, and then

send the product back to our company. Otherwise, the maintenance is not timely, so as not to affect your use.

## 七. Q&A

- (1) If there is no action to find 0 after starting the machine, check whether the red indicator light on the battery is on. The indicator light should be on here.
- (2) If 0 is not found, check whether the position sensor works normally.
- (3) The received image has Mosaic, due to the use of wireless signal clutter in the environment, restart the receiver, let the receiver re-select the channel.

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