

【Product Name】

User Manual

Model: 【Model TTS / TK / TT】

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1. Safety Instructions

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

- Do not use this product in flammable, explosive, or highly corrosive environments unless the product is explicitly rated for such use.
 - Do not disassemble, modify, or repair the product by yourself. Unauthorized modification will void the warranty.
 - Do not expose the product to temperatures above 【60】 °C or direct sunlight for prolonged periods.
 - If any abnormal condition occurs (unexpected motion, overheating, smoke, unusual smell), press the EMERGENCY STOP switch immediately.
 - Keep the product out of reach of children and untrained personnel.
 - Disconnect the power supply before performing any maintenance on the receiver control box or actuators.
 - Ensure the DC power matches the rated input voltage (12V or 24V DC). Wrong voltage will damage the receiver and actuators.
 - Do not operate the transmitter when the battery is low. Charge it fully before use to avoid signal loss during operation.
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2. Product Introduction

【Product Name】 is an industrial wireless remote control system, designed to provide reliable long-distance control of hydraulic valves, gear-coupled actuators, and linear actuators on industrial truck cranes, mobile equipment, and various machinery.

The system consists of a handheld transmitter, a receiver control box, clutch actuators, one linear actuator, a waterproof switch, and a mounting kit.

Key Features:

- **433 MHz wireless RF communication with 100 mW transmit power**
 - Long control distance: 500 – 1000 m in open field
 - IP68 waterproof receiver control box, suitable for outdoor and harsh environments
 - Compatible with 12V and 24V DC power systems
 - 11 independent output channels
 - Real-time battery level and signal distance LED indicators on the transmitter
 - Emergency stop switch for immediate power-off protection
 - Manual emergency input supported as a backup operation mode
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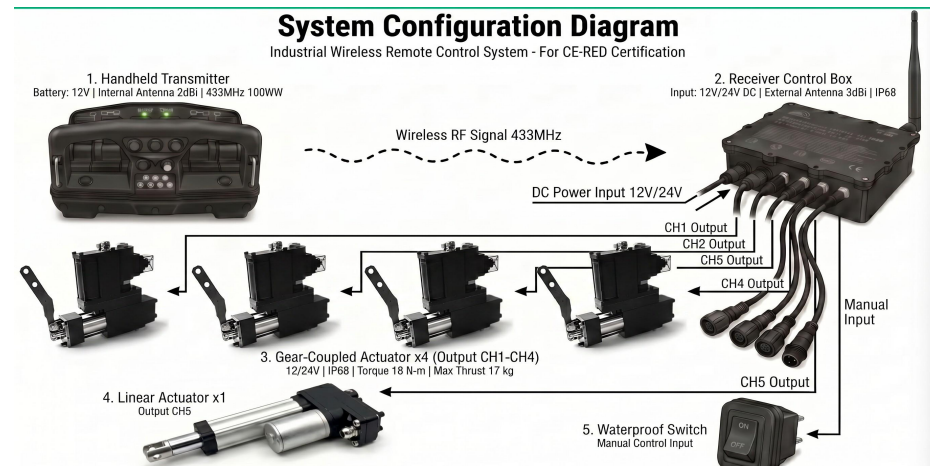
3. Packing List

No.	Item	Qty
1	Handheld Transmitter	1
2	Receiver Control Box (with wiring harness)	1
3	Electromagnetic Clutch Actuator	2 – 8
4	Linear Actuator	1
5	Waterproof Manual Emergency Switch	1
6	Transmitter Battery Pack	2
7	Battery Charger (including in-vehicle charger)	1
8	Mounting Kit	1
9	Accessory Box	1
10	Shoulder Strap	1
11	Identification Diagram	1
12	Relay Control Cable	2

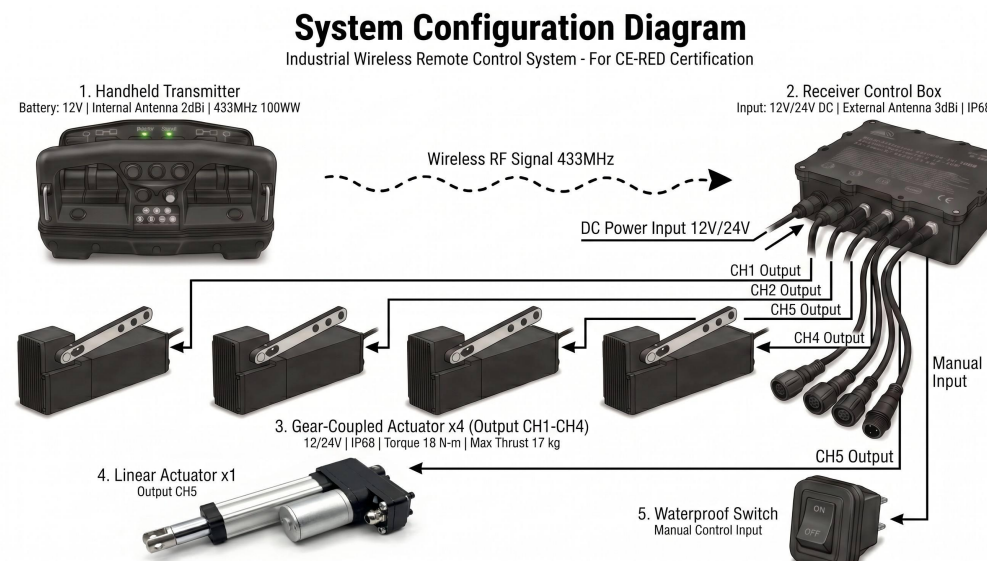
 Please check all items upon receipt. Contact your supplier within 7 days if anything is missing or damaged.

4. System Configuration Overview

The diagram below shows how all components are connected and how signals flow through the system:



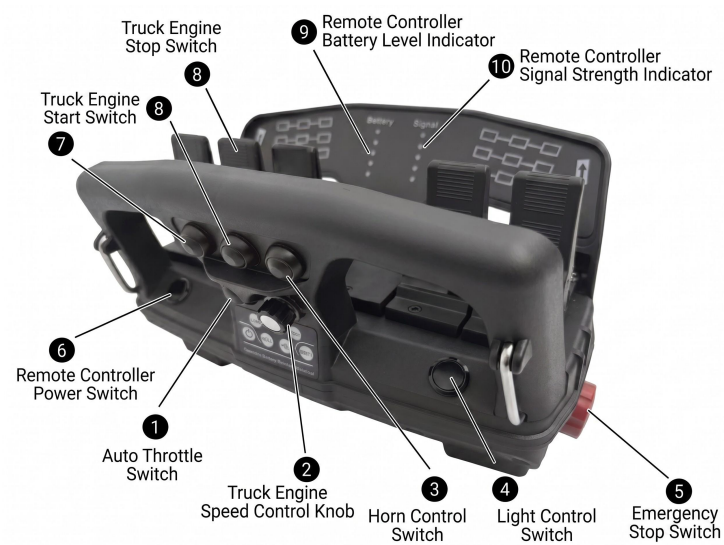
System Configuration Diagram



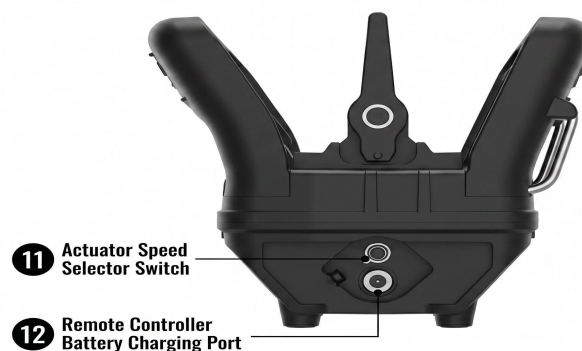
Signal Flow:

1. The handheld transmitter wirelessly sends control commands via 433 MHz RF signals.
 2. The receiver control box decodes the signals and outputs corresponding analog control commands to the actuators.
 3. CH1–CH6 drive the clutch actuators (proportional output, e.g. for hydraulic valve control).
 4. CH5 drives one linear actuator (push-pull output, typically for truck engine speed control).
 5. The waterproof manual switch provides a wired input.
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5. Handheld Transmitter — Layout & Function



Handheld Transmitter — Front View



Handheld Transmitter — Side View

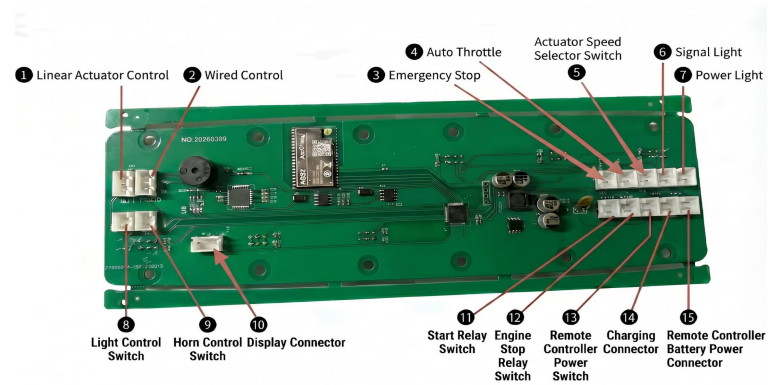
No.	Component	Function
1	Auto Throttle Switch	Turns the auto throttle mode ON / OFF
2	Truck Engine Speed Control Knob	Rotary knob for adjusting the truck engine speed
3	Horn Control Switch	Press to activate the vehicle horn
4	Light Control Switch	Turns the vehicle lights ON / OFF
5	Emergency Stop Switch	Press to immediately stop all operations (red mushroom button)
6	Transmitter Power Switch	Turns the transmitter ON / OFF
7	Truck Engine Start Switch	Press to start the truck engine
8	Truck Engine Stop Switch	Press to stop the truck engine
9	Battery Level Indicator	LED row showing remaining battery level
10	Signal Strength Indicator	LED row showing wireless signal strength

11	Actuator Speed Selector Switch	Toggles between fast and slow actuator response
12	Transmitter Charging Port	Connect the original charger to recharge the transmitter battery

6. Handheld Transmitter Operating Instructions

- 1, Press the transmitter power switch; the red POWER LED lights up. When the wireless connection with the receiver control box is established, the green SIGNAL LED lights up, indicating the transmitter is properly connected and ready for operation.
- 2, When you push the joystick, the green SIGNAL LED flashes continuously, indicating the transmitter is connected to the receiver and outputting signals.
- 3, In an emergency, press the red EMERGENCY STOP switch. The transmitter will stop all signal output, and all actuators will immediately return to the center and stop. The green SIGNAL LED and red POWER LED will flash alternately, and the buzzer will sound an alarm.
- 4, Switch No. 11 is the actuator speed selector. When turned ON, all channel actuators will move slowly.
- 5, Joystick Direction Setup: While turning on the power switch, press and hold the STOP button to enter programming mode. The signal and power indicators will flash simultaneously, indicating you have entered programming mode. Select the joystick you wish to adjust. Push the joystick forward and then press the START button. The power indicator will flash once and the actuator will immediately reverse its working direction, confirming the direction has been set. After completing the travel or joystick direction setup, press and hold the STARTUP button. The signal light will flash three times, indicating the program has been saved successfully.

7. Handheld Transmitter Troubleshooting



1, The transmitter circuit board layout is shown below.

2, Fault: Transmitter cannot establish a signal connection — the green LED does not work.

Step	Check	Diagnosis	Action
1	Check whether the receiver control box antenna is properly installed and connected	Whether the antenna is installed or loose	● Install the antenna correctly
2	Open the black control box and check whether the internal circuit board LEDs work	1. LED does not light 2. LED lights up normally	1, LED does not light: ● Check whether the blue/brown wires of the waterproof switch (positive & negative) are connected correctly. LED lights up normally: ● Check the receiver control PCB

			LED. If it does not work, contact the manufacturer to replace the PCB.
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2, Fault: Transmitter is working, but pushing the joystick does not drive the actuators.

Step	Check	Diagnosis	Action
1	Transmitter green LED	1. LED does not flash when pushing joystick 2. LED flashes when pushing joystick	1. LED does not flash: ● Replace the joystick. If it still does not work, contact the manufacturer. 2. LED flashes: ● Check the internal circuit boards, cable connectors, and actuators inside the control box.

 Only use the original charger supplied with the product. Non-original chargers may damage the built-in battery.

8. Receiver Control Box



Receiver Control Box

Description: IP68 waterproof receiver control unit that decodes wireless signals from the transmitter and drives up to 6 output channels.

Technical Specifications (from product label):

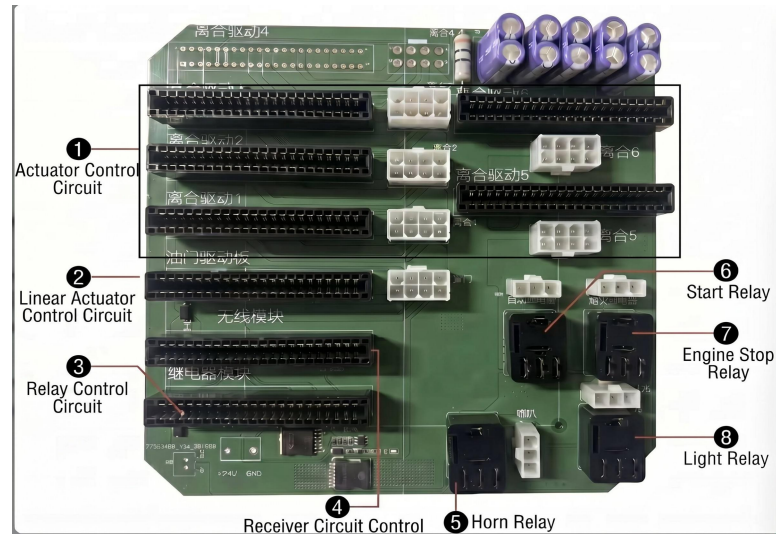
Parameter	Value
Control Distance	500 – 1000 m (line-of-sight)
Host Working Voltage	24 V DC
Waterproof Grade	IP68
RF Frequency	433 MHz
Output Channels	6 channels (CH1 – CH6)
Certification	CE / RoHS / FCC / RED / SCCP

Front Interfaces:

- DC Power Input — connects to 24V DC power supply
- CH1–CH6 Output — connect to 6 gear-coupled actuators
- CH5 Output — connects to the linear actuator
- Manual Input — connects to the waterproof emergency switch
- Relay Output — connects to 4 relay switches

Control Box Components:

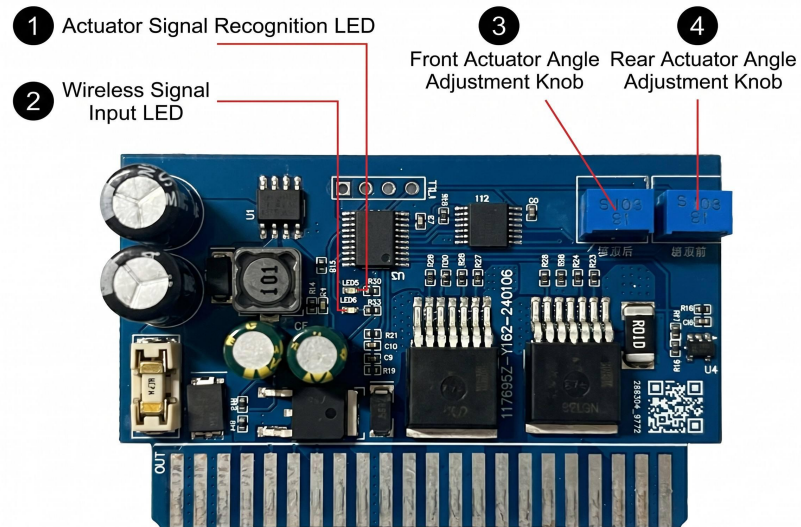
1. Control panel (as shown):



No.	Component	Function
1	Actuator Driver PCB Slot	Holds up to 6 channels of actuator driver PCBs
2	Linear Actuator Driver PCB Slot	Typically used for truck engine speed control drive
3	Relay Driver PCB Slot	Controls 4 channels of relay switches

4	Wireless Receiver Module PCB Slot	Receives signals from the transmitter
5	Horn Relay Slot	Typically used for the horn relay switch (NO / NC)
6	Truck Engine Start Relay Slot	Typically used for the truck engine start relay switch (NO / NC)
7	Truck Engine Stop Relay Slot	Typically used for the truck engine stop relay switch (NO / NC)
8	Light / Solenoid Safety Valve Relay Slot	Typically used for the light or hydraulic safety valve lock relay switch (NO / NC)

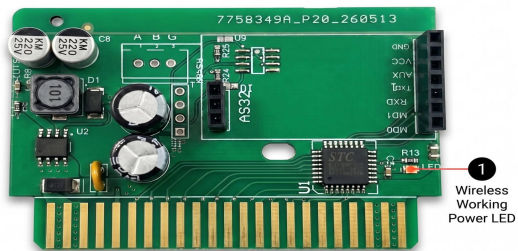
3, Actuator Driver PCB (as shown):



No.	Component	Function
1	Actuator Signal Recognition LED	Once the actuator is connected and the driver PCB detects the correct voltage signal, the LED will turn OFF.

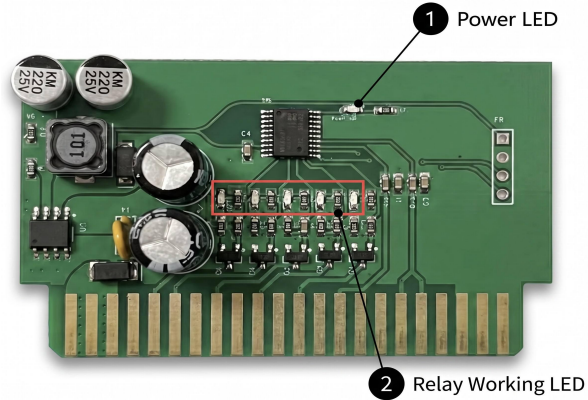
2	Signal Input Recognition LED	When the receiver PCB sends a signal to the driver PCB, this LED will start flashing.
3	Front Actuator Angle Adjustment Potentiometer	Adjusts the maximum forward angle limit of the actuator.
4	Rear Actuator Angle Adjustment Potentiometer	Adjusts the maximum backward angle limit of the actuator.

4. Receiver PCB (as shown):



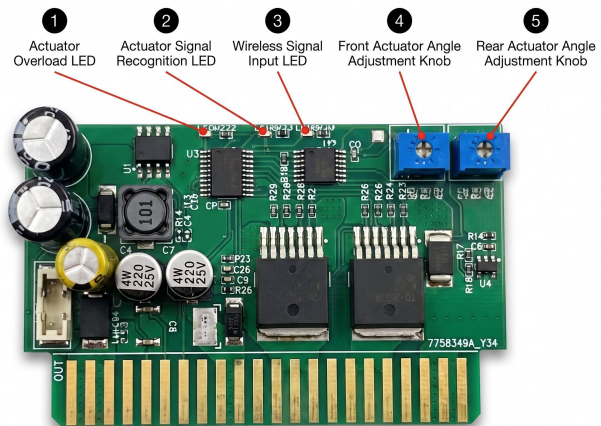
No.	Component	Function
1	LED Indicator	Wireless module working-power LED indicator

4, Relay Control PCB (as shown):



No.	Component	Function
1	Relay Power LED	After turning on the control box, this LED lights up to indicate the relay PCB is powered normally.
2	Relay Working LED	When a relay is activated, the corresponding LED lights up.

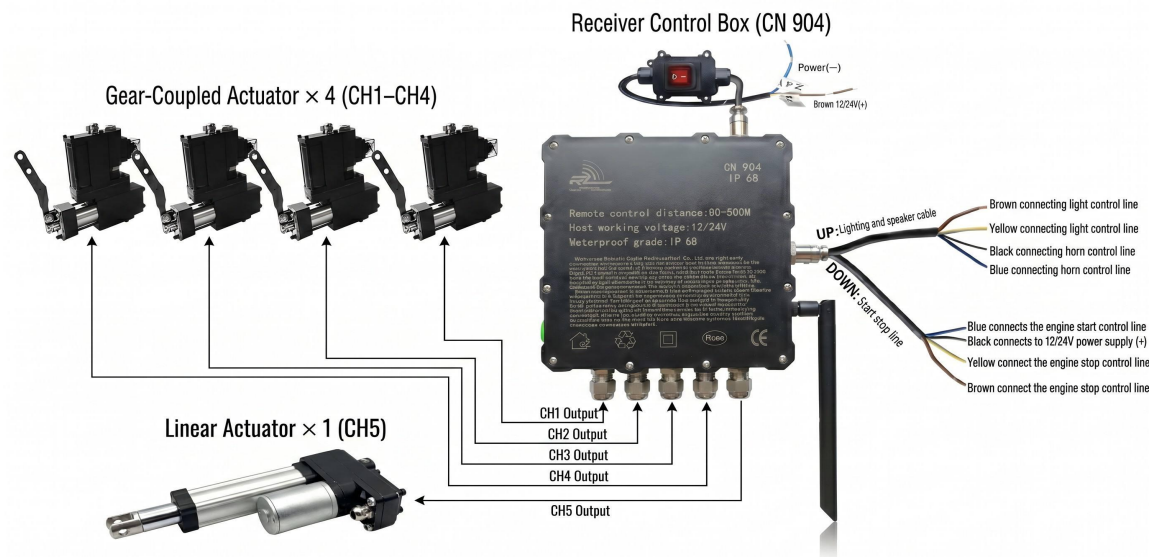
5, Linear Actuator Driver PCB (as shown):



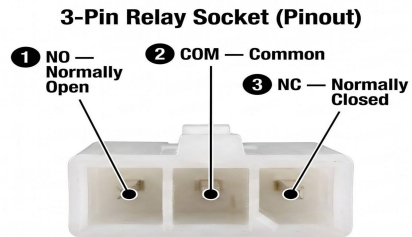
No.	Component	Function
1	Actuator Overload LED	When the actuator is overloaded and current rises, the driver PCB activates protection and reduces the current; this LED will slowly flash.
2	Actuator Signal Recognition LED	Once the actuator is connected and the driver PCB detects the correct voltage signal, the LED will turn OFF.
3	Signal Input Recognition LED	When the receiver PCB sends a signal to the driver PCB, this LED will start flashing.
4	Front Actuator Angle Adjustment Potentiometer	Adjusts the maximum forward angle limit of the actuator.
5	Rear Actuator Angle Adjustment Potentiometer	Adjusts the maximum backward angle limit of the actuator.

9, Receiver Control Box Operating Instructions

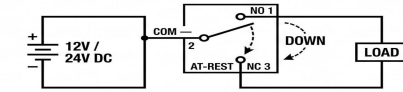
1, Control Box Connection Diagram



- 2, The control box input voltage is 24V. If a 12V power source must be used, an additional 24V transformer is required.
- 3, After the control box is installed, install the antenna, then connect 24V power through the waterproof switch cable — Brown to 24V positive, Blue to 24V negative.
- 4, Turn on the waterproof switch and the transmitter. When the transmitter and receiver control box are connected, the green LED will be steadily ON. When the receiver receives commands from the transmitter, the green LED will flash rapidly.
- 5, For long-term rainy environments or when possible, install a protective cover to extend the service life of the transmitter.
- 6, The relay control lines do NOT output 24V power — they are switches only. The controlled devices must be separately connected to 24V or 12V power to operate.
- 7, The switching between Normally Open (NO) and Normally Closed (NC) relay configurations is shown in the diagram.

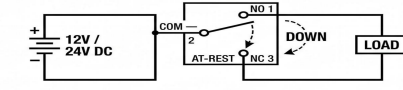


Normally Open (NO) Circuit — Pin 1



- At rest: circuit is OPEN, no current to load.
- Coil energized: circuit CLOSES, current flows to load.

Normally Closed (NC) Circuit — Pin 3



- At rest: circuit is CLOSED, current flows to load.
- Coil energized: circuit OPENS, load turns off.

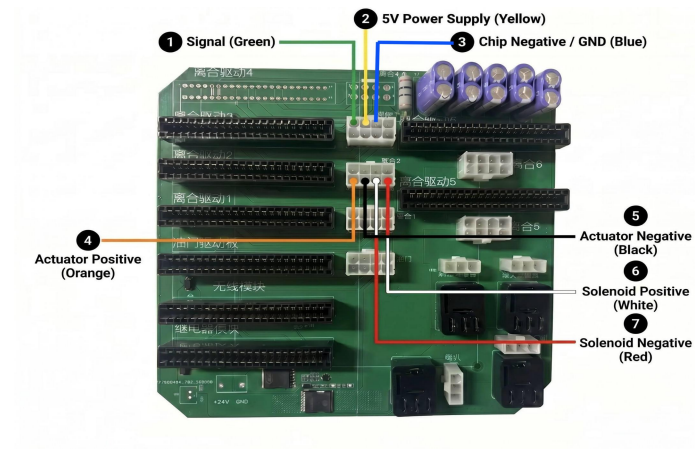
LEGEND: NO = Normally Open | COM = Common | NC = Normally Closed

8, Relay cable installation can be difficult. If you are not familiar with electrical circuits, please contact a local electrical engineer for installation.

9, Before installing the control box, connect 24V power and test every function to ensure it works correctly.

10, Receiver Control Box Troubleshooting

1, Receiver control box actuator wiring diagram:



1, Fault: When pushing the transmitter joystick, individual actuators do not work

Step	Check	Diagnosis	Action
1	Check the actuator driver PCB power-detection LED	1. Not working 2. Working	1, Not working: ● Replace the PCB Working: ● Proceed to the next step
3	Check whether the green LED on the control box is flashing	1. Flashing: The actuator-signal-recognition LED on the driver PCB is active, meaning the driver PCB is NOT receiving a signal from the actuator. Possible causes: ● Actuator chip damaged; ● Green signal wire in the connector has poor contact; ● Driver PCB fault. 2. Not flashing.	1. Green LED is flashing: ● Connect the faulty actuator to another working channel. If it still does not work, the actuator chip is damaged — replace the chip. ● If the actuator now works, the problem is either the driver PCB or a poor contact on the white cable connector. (1) Plug another working white connector into the faulty channel: if the motor works, the cable had a bad contact. (2) If the actuator still does not work, the driver PCB is faulty — replace the PCB. 2. Green LED is not flashing:

			● Check the transmitter or the emergency stop switch.
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2, Fault: When pushing the transmitter joystick, ALL actuators do not work

Step	Check	Diagnosis	Action
1	Check whether the wireless connection is normal	Check whether the transmitter signal LED is working normally 1, Working normally: check whether the voltage is exactly 24V. Not working normally: check antenna installation and the receiver PCB power LED inside the control box. 2,	1. Green LED working normally: ● For 12V supply, add a 24V transformer. For 24V supply, use a multimeter to check voltage and current. 2. Green LED not working normally: ● Install the antenna correctly. ● Check whether the receiver PCB LED inside the control box is working normally; then contact the manufacturer to request replacement parts.

Fault 3: The receiver cannot receive signals from the transmitter

Step	Check	Diagnosis	Action
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1	Check the LEDs on the internal PCBs of the control box	1. If no LEDs inside the control box are working, the control box is not connected to 24V power.	● Check whether the power supply is a proper 24V. ● Check whether the positive and negative of the waterproof switch are connected correctly. ● Disassemble the waterproof switch and check whether the internal wires have poor contact.
2	Check the receiver PCB	1. Check whether the wireless-power LED on the receiver PCB is working normally.	1. LED working normally: ● Check the transmitter or antenna installation. 2. LED off: ● Contact the manufacturer to replace the receiver PCB.

Fault 4: Control box relays do not work

Step	Check	Diagnosis	Action
1	Listen for the relay clicking sound from the control box	1, The control box makes relay clicking sound. The control box does	1, Relay clicking sound present: ● Indicates poor cable contact — check the cables.

		NOT make relay clicking sound.	No relay clicking sound: ● Open the control box and check the power LED and working LED on the relay PCB. If both are normal, the relay itself is damaged. If the power LED is abnormal, contact the manufacturer to replace the relay PCB. If the working LED is not lit, check the button switches on the transmitter.
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6, Fault 5: The linear actuator does not work when turning the rotary switch

Step	Check	Diagnosis	Action
1	Check the linear-actuator driver PCB power-detection LED	1. Not working 2. Working	1, Not working: replace the PCB Working: proceed to the next step
2	Check the actuator-signal-recognition LED on the linear-	1. Flashing: The signal-recognition LED is active, meaning the driver PCB is NOT receiving a signal from the actuator. Possible causes: ● Linear actuator chip	1. Flashing: ● Connect the faulty actuator to another working channel. If the same problem persists, the linear actuator chip is damaged — replace the chip.

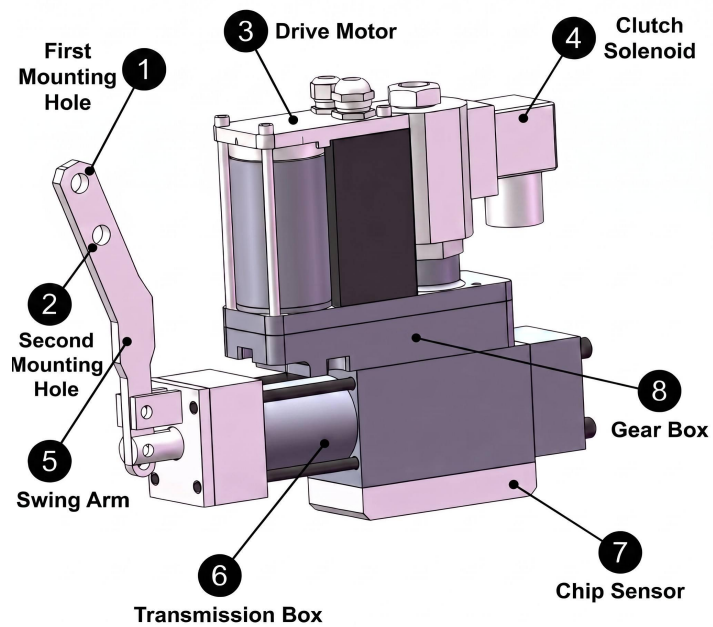
	actuator driver PCB	damaged; ● Green signal wire in the connector has poor contact; ● Driver PCB fault. 2. Not flashing: The problem is on the transmitter side — check the rotary switch on the transmitter.	● If the linear actuator now works, the problem is either the driver PCB or a poor contact on the white cable connector. (1) Plug another working white connector into the faulty channel: if the motor works, the cable had a bad contact. (2) If the linear actuator still does not work, the driver PCB is faulty — replace the PCB.
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 Do NOT reverse the DC input polarity. Reversed polarity will permanently damage the receiver.

11. Clutch Actuator

Description: A 12/24V compact electric actuator equipped with an electromagnetic clutch. When energized, the output shaft is engaged with the motor; when de-energized, the output shaft is disengaged. It provides a lever-arm output and is driven by the receiver — typically used for hydraulic valve control.

1. Actuator



No.	Component	Function
1	No. 1 Mounting Hole	Longer travel, smaller pushing force
2	No. 2 Mounting Hole	Shorter travel, larger pushing force
3	Drive Motor	Power source of the actuator
4	Electromagnetic Clutch	Engages / disengages the power output
5	Swing Arm	Drives the actuator travel
6	Transmission Box	Transfers the actuator power output
7	Chip Sensor	Reads the actuator position
8	Gear Box	Provides greater force to the actuator

Technical Specifications:

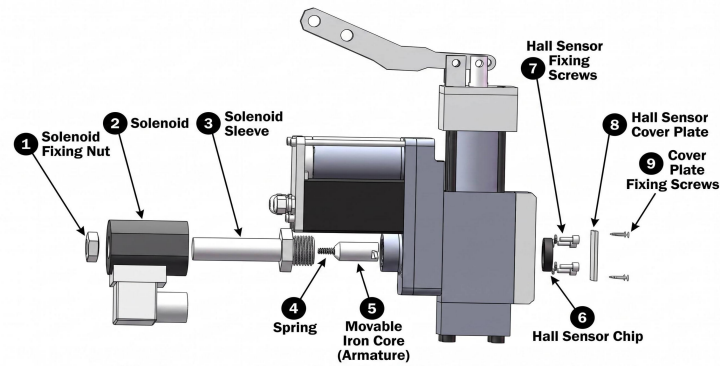
Parameter	Value
Working Voltage	12 V / 24 V DC
Waterproof Grade	IP68
Rated Torque	18 N·m
Maximum Thrust	17 kg
Output Type	Lever arm (rotary)
Solenoid Working Voltage	24 V DC
Weight	1.8 kg
Actuator Travel	5 cm forward / 5 cm backward

12. Clutch Actuator Operating Instructions

1. Before installing the actuator, test that it is functioning normally.
2. The actuator connector must be correctly plugged into the control box cable, and the waterproof nut tightened.
3. After installing the actuator, install the connecting rod between the hydraulic valve lever and the actuator swing arm, and the hydraulic valve lever clamp. (Note: the hydraulic valve lever clamp must ensure the forward and backward travel does not exceed 5 cm.) Adjust with the threads to keep the mid-point of the hydraulic valve lever aligned with the mid-point of the actuator swing arm.
4. Connect the transmitter and open the black control box. Locate the corresponding actuator driver PCB, push the transmitter joystick to its maximum, and use a tool to adjust the blue maximum-limit trimmer on the driver PCB so that the maximum travel of the hydraulic valve lever matches the maximum travel of the actuator swing arm.
5. In rainy locations or where possible, install a protective cover to extend the service life of the actuator.

13. Clutch Actuator Troubleshooting

1. Clutch Actuator — Component Diagram



No.	Component	Function
1	Solenoid Fixing Nut	Locks and secures the solenoid
2	Solenoid	When energized, provides magnetic force to drive the clutch
3	Solenoid Sleeve	Transmits magnetism and guides the movement direction of the movable iron core
4	Spring	When de-energized, disengages the clutch through spring force
5	Movable Iron Core	When energized, engages the clutch through magnetic force
6	Hall Sensor Chip	Reads the actuator position
7	Hall Sensor Fixing Screw	Locks and secures the Hall sensor chip
8	Hall Sensor Cover Plate	Seals the Hall sensor chip and the internal cables
9	Cover Plate Fixing Screw	Locks and secures the cover plate

Fault 2: The actuator does not work at all — the red LED on the solenoid is off

Step	Check	Diagnosis	Action
1	Plug the actuator into	1. Not working	1, Not working:

	another known-working channel of the receiver control box and check.	2. Working	● The actuator Hall angle sensor is damaged — replace the Hall angle sensor. 2. Working: Open the receiver control box and check the signal-input-recognition LED and signal-recognition LED on the actuator driver PCB. ● Signal-input-recognition LED off: replace the PCB. ● Signal-recognition LED on continuously: move the actuator driver PCB into another working channel. If the LED turns off there, the control box white connector has poor contact. If the LED still lights, replace the PCB. ● Operate the transmitter: ~ Signal-input-recognition LED flashes: move the driver PCB to another working channel — if the actuator works, the white connector has poor contact; if not, replace the PCB.
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			~ Signal-input-recognition LED does not flash: check whether the control box green LED is flashing. If it is, replace the PCB. If not, check the transmitter or the joystick.
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Fault 3: The actuator does not work — the red LED on the solenoid is lit

Step	Check	Diagnosis	Action
1	Plug the actuator into another known-working channel of the receiver control box and check.	1. Not working 2. Working	1. Not working: • Listen for a metallic click from the solenoid. ~ Yes, and the drive motor is silent — the drive motor is damaged. (Check its wiring: if abnormal, resolder with a soldering iron; if normal, replace the actuator.) ~ No click, but the drive motor makes turning sounds — disassemble the solenoid sleeve and check whether the internal small spring is stuck or too strong. If the spring is too strong, cut one turn off the spring. 2. Working: • Open the receiver control box and check

			the actuator driver PCB. Move the PCB to another working channel: ~ If the actuator works, the positive/negative of the white connector has poor contact. ~ If it does not, the driver PCB is damaged — replace the PCB.
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Fault 4: The actuator does not work — the red LED on the solenoid is off, but the drive motor makes turning sounds

Step	Check	Diagnosis	Action
1	Check the solenoid rear cover	1. Through the transparent plastic cover, check whether the internal wiring has come loose.	1. Loose: ● Remove the rear cover and reconnect the wires. 2. Not loose: ● Check the control box.
2	Check the control box	Check whether the white connector cable in the control box is connected properly.	1. Normal: ● Replace the driver PCB. 2. Abnormal: ● Connect the solenoid cable correctly.

14. Linear Actuator



Linear Actuator

Description: An electric linear actuator driven by the receiver control box. It provides push-pull motion and is typically used for truck engine speed control. When the actuator is fully extended, it is at the zero point.

Technical Specifications:

Parameter	Value
Working Voltage	12 V / 24 V DC
Output Type	Linear push-pull
Stroke	6 cm
Rated Load	15 kg

Rated Speed	40 mm/s
Waterproof Grade	IP65
Qty	1 unit
