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## SPARKHOBBY KM1203MD

# SPARKHOBBY KINGMAX KM1203MD Mini Digital Servo Instruction Manual

## 1. INTRODUCTION

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Thank you for choosing the SPARKHOBBY KINGMAX KM1203MD Mini Digital Servo. This high-performance servo is designed for precision control in various remote-controlled applications, including FPV racing drones and 450 class helicopter tail rotors. Featuring a durable metal case, metal gears, and a coreless motor, it offers reliable and responsive operation. This manual provides essential information for proper installation, operation, maintenance, and troubleshooting to ensure optimal performance and longevity of your servo.



Image 1.1: The SPARKHOBBY KINGMAX KM1203MD Mini Digital Servo with its metal arm.

## 2. SAFETY INFORMATION

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- Always ensure the correct operating voltage (DC5.0 ~ 8.4V) is supplied to the servo. Exceeding this voltage can cause permanent damage.
- Avoid applying excessive force to the servo horn or output shaft, as this can strip gears or damage the internal mechanism.
- Keep the servo away from water and moisture, as it is not waterproof.
- Ensure all connections are secure and correctly polarized to prevent short circuits or malfunction.
- Do not attempt to disassemble the servo unless you are a qualified technician, as this may void the warranty and cause damage.

## 3. PACKAGE CONTENTS

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Verify that all items are present in your package:

- 1 x KINGMAX KM1203MD Mini Digital Servo
- 1 x Metal Servo Arm (as specified in the product variant)

- Assorted Plastic Servo Horns/Arms
- Mounting Screws



Image 3.1: Included plastic servo horns and mounting hardware.

#### 4. PRODUCT FEATURES

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- High-performance programmable metal gears (copper + titanium) mini digital servo.
- High-quality coreless motor for efficient and responsive operation.
- Full CNC aluminum hulls and frame for enhanced durability and heat dissipation.
- Double ball bearings for smooth movement and reduced friction.
- Ideal for 450 class helicopter wash plate and various RC FPV racing drone applications.



Image 4.1: Internal view highlighting the durable metal gears.

## 5. SPECIFICATIONS

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Feature	Specification
Model	KM1203MD
Equipment	Metal Gears
Spline	Exclusive
Motor Type	Coreless Motor
Bearing	2BB (Double Ball Bearings)
Dead Band	2 $\mu$ s (by default)
Waterproof	No
Operating Voltage	DC5.0 ~ 8.4V
Operating Frequency	1520 $\mu$ s / 330Hz
Operating Speed (5.0V)	0.08 sec / 60 degrees (no load)
Operating Speed (6.0V)	0.07 sec / 60 degrees (no load)
Operating Speed (7.4V)	0.06 sec / 60 degrees (no load)
Operating Speed (8.4V)	0.06 sec / 60 degrees (no load)
Stall Torque (5.0V)	6.0 kg·cm (102.78 oz/in)
Stall Torque (6.0V)	7.4 kg·cm (102.78 oz/in)
Stall Torque (7.4V)	9.5 kg·cm (131.95 oz/in)
Stall Torque (8.4V)	10.5 kg·cm (131.95 oz/in)
Potentiometer	Direct Drive
Dimensions	23 x 12 x 27.5 mm (0.91 x 0.47 x 1.07 in)
Weight	20.3g (0.72oz)
Connector Cable Length	JR 220mm (8.58in)

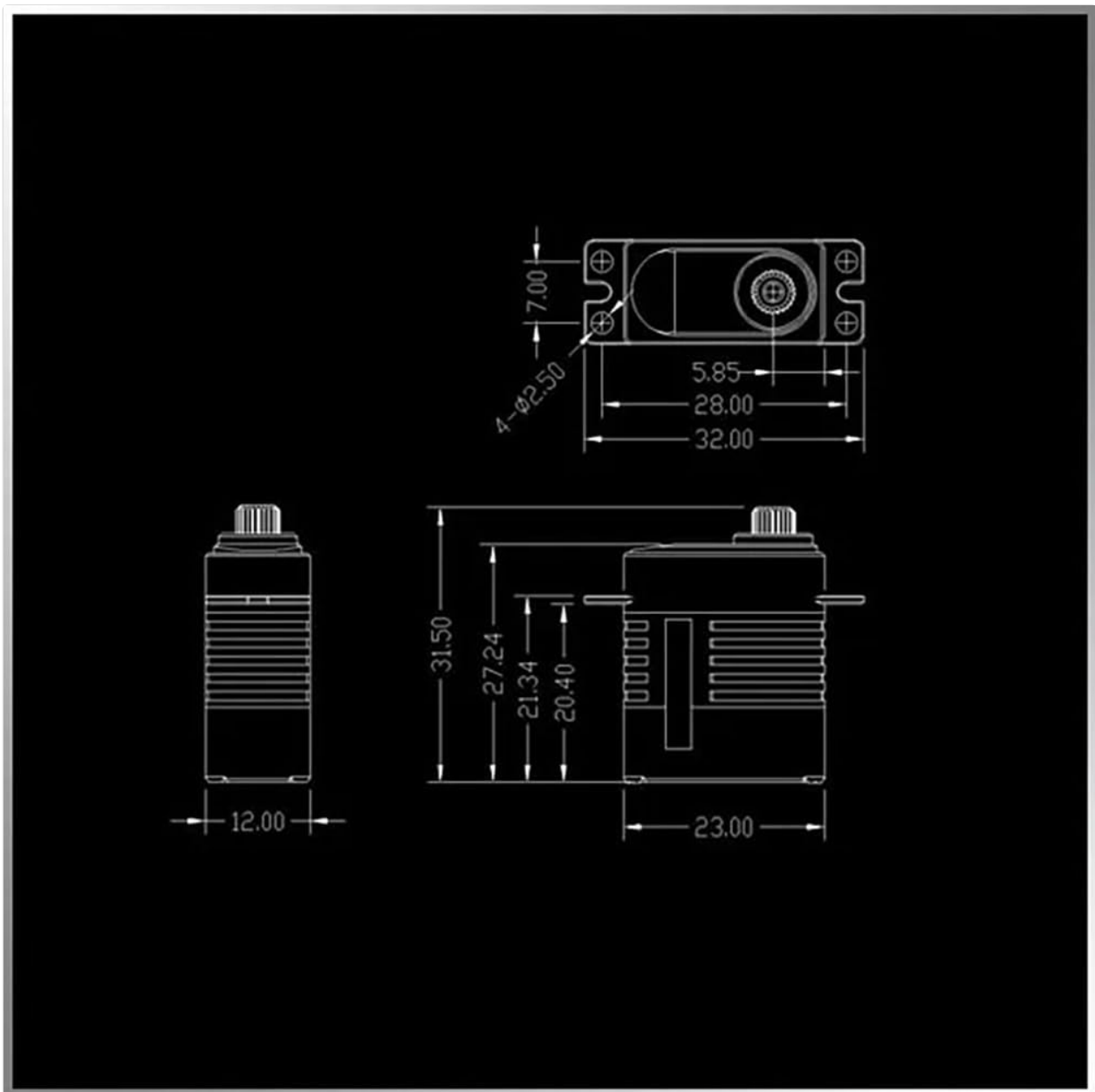


Image 5.1: Detailed dimensions of the KM1203MD servo.

## 6. SETUP AND INSTALLATION

### 6.1 Mounting the Servo

1. Identify a suitable mounting location on your RC model that provides adequate clearance for servo movement and linkage.
2. Use the provided mounting screws to secure the servo firmly to the model's frame. Ensure the servo is mounted straight and without any binding.
3. Avoid over-tightening screws, which can damage the servo casing.

### 6.2 Attaching the Servo Horn

1. Before attaching the servo horn, connect the servo to your receiver/flight controller and power it on. This will center the servo.
2. Select the appropriate servo horn (metal or plastic) for your application.
3. Carefully push the servo horn onto the output shaft, ensuring it is aligned correctly (usually perpendicular to the servo body for initial setup).

4. Secure the servo horn with the small screw provided, inserting it through the center of the horn into the servo shaft.

### 6.3 Electrical Connection

1. Connect the servo's JR connector cable to the designated servo channel on your RC receiver or flight controller.
2. Ensure the polarity is correct: typically, the brown wire is ground, red is positive voltage, and orange/yellow is the signal wire. Refer to your receiver/flight controller manual for specific pinouts.
3. Verify that the power supply to the receiver/flight controller is within the servo's operating voltage range (DC5.0 ~ 8.4V).

## 7. OPERATING INSTRUCTIONS

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Once installed and connected, the KM1203MD servo operates by receiving pulse-width modulation (PWM) signals from your RC receiver or flight controller. The duration of these pulses determines the angular position of the servo arm.

- **Centering:** Upon initial power-up, the servo will typically move to its neutral (centered) position.
- **Control Input:** Use your transmitter's control sticks or flight controller software to send commands to the servo, causing it to rotate to the desired angle.
- **Range of Motion:** The servo has a specific range of motion. Avoid forcing the servo beyond its mechanical limits, as this can cause damage to the gears or motor. Adjust your transmitter's end-points (travel adjust) to prevent over-travel.
- **Programming:** This is a programmable servo. Advanced users may use compatible programming tools (sold separately) to adjust parameters such as speed, torque, and dead band if desired. Refer to the programming tool's manual for instructions.

## 8. MAINTENANCE

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Proper maintenance ensures the longevity and consistent performance of your servo.

- **Keep Clean:** Regularly clean the servo exterior to prevent dust and debris from entering the mechanism. Use a soft, dry cloth.
- **Check Linkages:** Periodically inspect all linkages connected to the servo arm for any binding, looseness, or damage. Ensure smooth, free movement.
- **Inspect Gears:** If you notice unusual noise or play in the servo, it may indicate worn gears. While the KM1203MD features durable metal gears, extreme stress can still cause wear.
- **Avoid Overload:** Do not continuously operate the servo under heavy load or allow it to stall, as this can lead to overheating and premature wear of the motor and gears.
- **Storage:** Store the servo in a dry, cool environment away from direct sunlight and extreme temperatures.

## 9. TROUBLESHOOTING

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If you encounter issues with your KM1203MD servo, refer to the following troubleshooting guide:

- **Servo Not Responding:**
  - Check all electrical connections for proper seating and polarity.
  - Verify that the receiver/flight controller is powered on and receiving signals from the transmitter.

- Ensure the power supply voltage is within the servo's operating range (DC5.0 ~ 8.4V).
  - Test the servo on a different channel or with a servo tester to rule out receiver/flight controller issues.
- **Servo Jittering or Glitching:**
    - Check for electromagnetic interference (EMI) from other electronic components. Keep servo wires away from power wires or ESCs.
    - Ensure the power supply is stable and sufficient. A weak BEC (Battery Eliminator Circuit) can cause jitter.
    - Inspect servo linkages for any binding or excessive friction.
    - Verify the dead band setting if using a programmable tool.
  - **Servo Making Noise but Not Moving:**
    - This often indicates stripped gears. Disassemble the servo (if you are experienced) to inspect the gears, or contact support for repair/replacement options.
    - Ensure the servo arm is not physically obstructed.
  - **Servo Overheating:**
    - Reduce the load on the servo.
    - Check for binding in the linkages.
    - Ensure adequate airflow around the servo.

## 10. WARRANTY INFORMATION

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SPARKHOBBY products are manufactured to high-quality standards. For specific warranty terms and conditions, please refer to the warranty information provided at the point of purchase or contact SPARKHOBBY customer support directly. Keep your proof of purchase for any warranty claims.

## 11. CUSTOMER SUPPORT

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For further assistance, technical support, or inquiries regarding your SPARKHOBBY KINGMAX KM1203MD Mini Digital Servo, please visit the official SPARKHOBBY store or contact their customer service department.

**SPARKHOBBY Store:** <https://www.amazon.com/stores/Sparkhobby/page/93FA3271-AE7C-42B3-8ABB-7AA9FB4A0995>