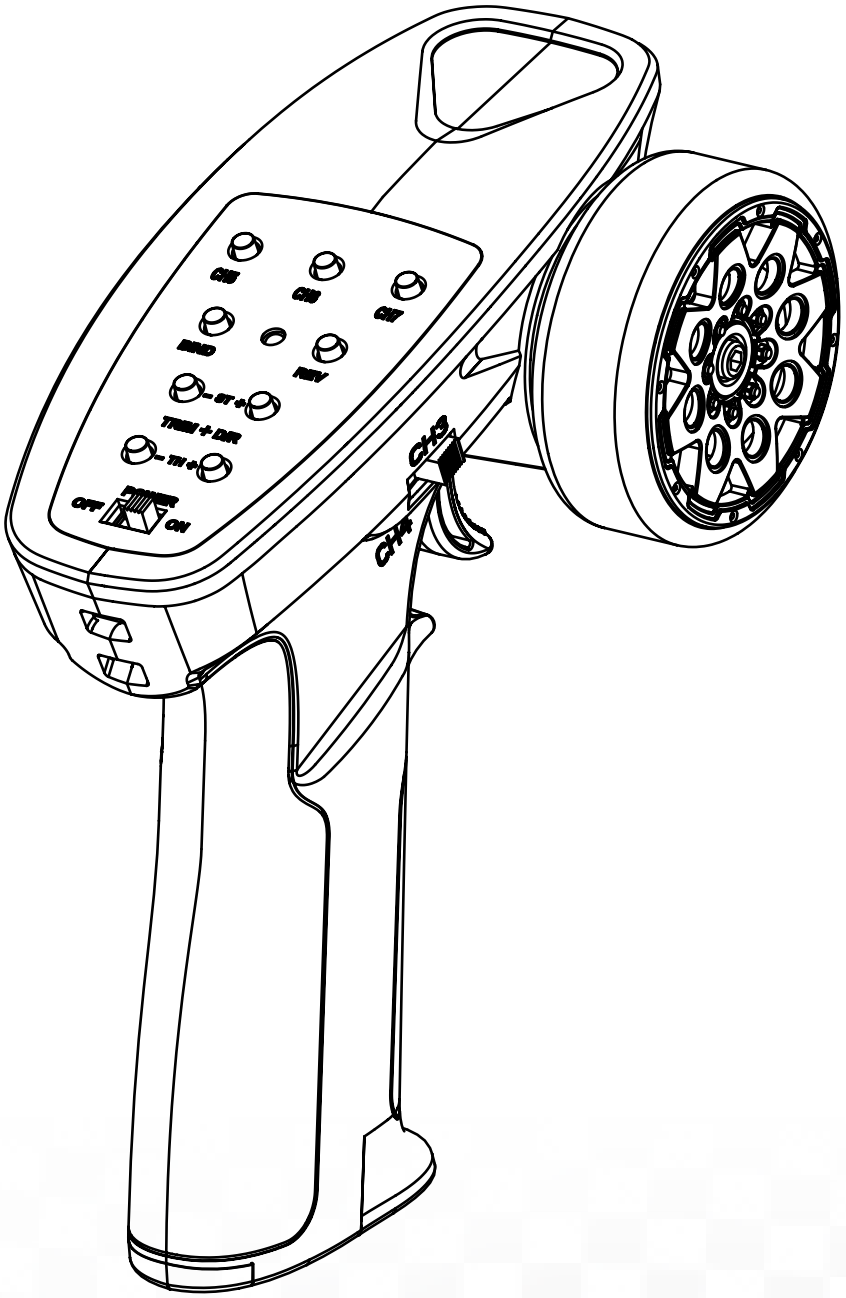
FMS-G7&FMS-R7A

USER MANUAL

Automatic Frequency Hopping
Digital System



15+

WARNING:
This product is only for 15 years old or above

Contents

1.Safety

1.1 Safety Symbols

Pay close attention to the following symbols and their meanings. Failure to follow these warnings could cause damage, injury or death.

Danger	• **Not following these instructions may lead to serious injuries or death.**
Warning	• **Not following these instructions may lead to major injuries.**
Attention	• **Not following these instructions may lead to minor injuries.**

1.2 Safety Guide

Prohibited **Mandatory**

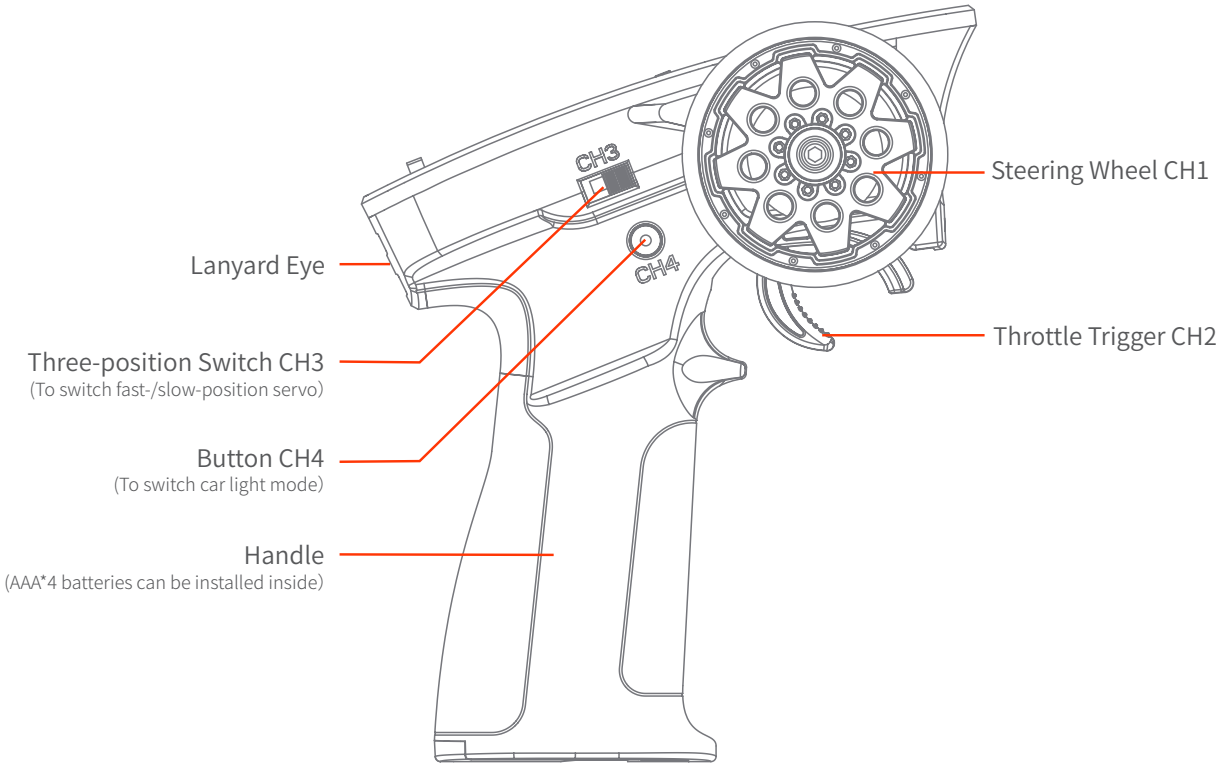
- **Do not use the product at night or in bad weather like rain or thunderstorm. It can cause erratic operation or loss of control.**
- **Do not use the product when visibility is limited.**
- **Do not use the product on rain or snow days. Any exposure to moisture (water or snow) may cause erratic operation or loss of control.**
- **Interference may cause loss of control. To ensure the safety of you and others, do not operate in the following places:**
  - Near any site where other radio control activity may occur
  - Near power lines or communication broadcasting antennas
  - Near people or roads
  - On any body of water when passenger boats are present
- **Do not use this product when you are tired, uncomfortable, or under the influence of alcohol or drugs. Doing so may cause serious injury to yourself or others.**
- **The 2.4GHz radio band is limited to line of sight. Always keep your model in sight as a large object can block the RF signal and lead to loss of control.**

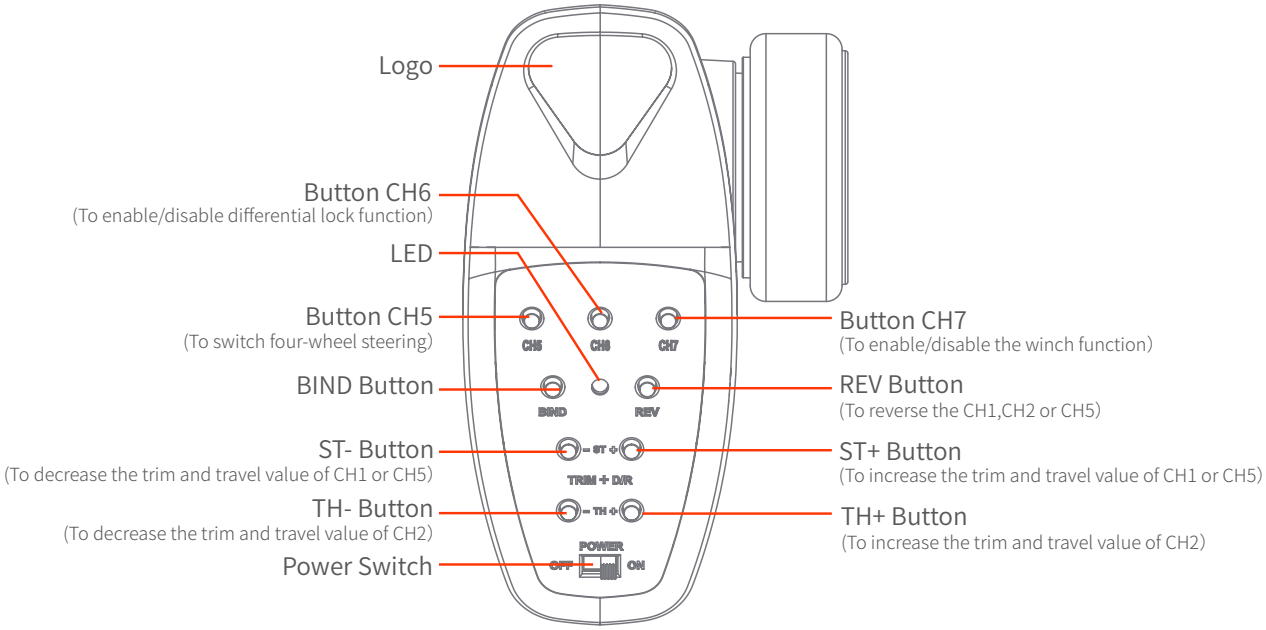
- **Misuse of this product may lead to serious injury or death. To ensure the safety of you and your equipment, read this manual and follow the instructions.**
- **Make sure the product is properly installed in your model. Failure to do so may result in serious injury.**
- **Make sure to disconnect the receiver battery before turning off the transmitter. Failure to do so may lead to unintended operation and cause an accident.**
- **Ensure that all motors operate in the correct direction. If not, adjust the direction first.**
- **Make sure the model stays within the systems maximum range to prevent loss of control.**

2.Introduction

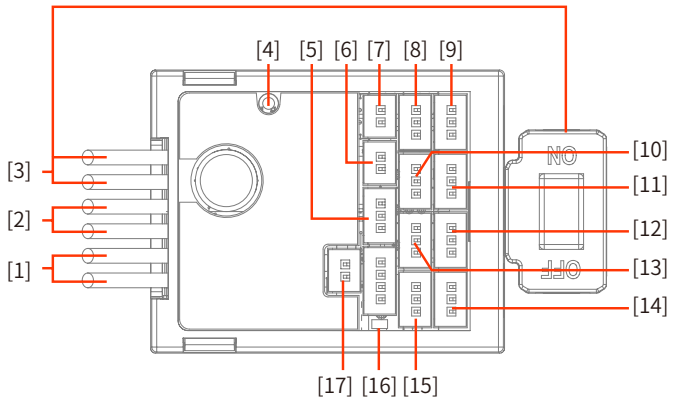
The product adopts the 2.4GHz AFHDS 2A-BS Automatic Frequency Hopping Digital System which consist of FMS-G7 transmitter and FMS-R7A reciever. It supports two-way transmission, featuring 7-channel and compatible with variety of car models.

2.1 Transmitter Overview





2.2 Receiver Overview



[1] Motor Interface （3.5bullet interface）

[2] XT30 Interface of the Battery

[3] Power Switch

[4] Antenna

[5] Left Light Interface + Right Light Interface

[6] Fog Light Interface

[7] Fog Light Interface

[8] Headlight Interface + Right Light Interface

[9] Headlight Interface + Left Light Interface

[10] CH6 Rear Differential Lock Servo

[11] CH4 Drive Switching Servo

[12] CH3 Fast-/slow-position servo

[13] CH6 Front Differential Lock Servo

[14] CH1 Front-wheel steering Servo

[15] CH5 Rear-wheel steering Servo

[16] Fog Light Interface + Brake Light Interface + Backup Light Interface

[17] CH7 Winch Motor Servo

2.2.1 The LED Status of the Receiver

The LED status indicates the power supply state of the receiver and its working state.

Off: The receiver is not powered on.

Light on in red: The receiver is connected to the power supply. It works normally.

Fast flashing: The receiver is in the bind mode.

Slow flashing: The LED flashes slowly when the transmitter is powered off, unbound, or no signal.

2.2.2 Interface

All the interfaces are 2.54 mm standard pins for connecting the receiver to each terminal part of the model.

2.2.3 Antenna

It is an external antenna.

⚠ Caution	• Do not pull the antenna of the receiver. Do not tie the antenna and the servo cable together.

⚠ Note	• Do not put the antenna close to the metal materials, because this will affect the signal strength of the receiver. Keep the receiver's antenna at least 1cm away from conductive materials such as carbon or metal.

3.Getting Started

Prior to operations, please install the battery and connect devices according to the sequence and guide as described in this chapter.

3.1 Transmitter Anttena

The transmitter has a built-in antenna. When the transmitter starts to work, the antenna automatically operate, without additional operations.

3.2 Receiver and Servo Installation

Make sure that the receiver is mounted in an appropriate location within the model, to ensure a stable signal, maximum range and to mitigate external interference, follow these guidelines:

Pay attention to the following when installing the receiver:

1. Make sure the receiver is not installed near ESCs or other sources of electrical noise.
2. Keep the receivers antenna away from conductive materials such as carbon or metal. To ensure normal function make sure there is a gap of at least 1cm between the antenna and the conductive material.

⚠ Caution	• To prevent damage do not power on the receiver during installation.

3.2 Installing Transmitter Battery

⚠ **Danger**	• **Only use specified battery (X4 AAA batteries).**
⚠ **Danger**	• **Do not open, disassemble, or attempt to repair the battery.**
⚠ **Danger**	• **Do not crush/puncture the battery, or short the external contacts.**
⚠ **Danger**	• **Do not expose to excessive heat or liquids.**
⚠ **Danger**	• **Do not drop the battery or expose to strong shocks or vibrations.**
⚠ **Danger**	• **Always store the battery in a cool, dry place.**
⚠ **Danger**	• **Do not use the battery if damaged.**

Battery Type: AAA

Follow the steps below to install the batteries:

1. Open the battery compartment cover.
2. Insert 4 AAA batteries with the correct polarity. Make sure it is connected with the correct polarity to avoid damage.
3. Replace battery compartment cover.

Low battery alarm: When the battery is lower than 4.2V, the transmitter will give a alarm with the LED flashing slowly.

4. Operation Guide

After setting up, follow the instructions below to use the product.

4.1 Power-on

Follow the steps below to turn on the transmitter:

1. Check to make sure that the batteries are fully charged and installed correctly.
2. Toggle the Power Switch to the [ON] position, and the LED will be solid on.
3. Connect the receiver to power.

Note: For safety always power on the transmitter before the receiver.

⚠ **Note**	• **Operate with caution in order to avoid damage or injury.**

4.2 The LED Status of the Transmitter

The LED status indicates the power supply state of the transmitter and its working state.
Off: The transmitter is not powered on.
Fast flashing: The transmitter is in the bind mode.
Slow flashing: Low voltage alarm
Three-flash-one-off: The transmitter is in standby state, while the bound receiver is powered off, unbound, or no signal.
Gradual: The transmitter is in Sleep mode or in Idle alarm state.

4.3 Binding

The transmitter and receiver have already been bound at the factory.

However if the receiver needs to be replaced or additional receivers bound follow these steps:

1. Turn on the transmitter while holding the bind button to put the transmitter into bind mode. Meanwhile the LED will flash quickly, and release the bind button.
2. The receiver will power on and wait for 1 second,if without connection, it will enter the binding state automatically;
3. The receiver's LED is solid on, indicating the binding is successful.
4. Check to make sure the transmitter and receiver functions are working correctly, repeat steps 1 to 3 (binding process) if any problems arise.

Note: If the binding is not completed within ten seconds, the LED of the receiver will enter its slow flashing state.

4.4 Stick Calibration

This function is used to set the neutral position for throttle trigger and steering wheel.

Every transmitter is calibrated before leaving the factory, however if recalibration is required, please follow these steps:

1. Turn and hold the wheel clockwise to the max travel point and push the throttle forwards as far as possible, then turn on the transmitter. It will enter calibration mode. The buzzer sounds shortly in cycle for prompt.
2. Turn the steering wheel to max and min travel point in clockwise and counterclockwise. Then push/pull the trigger to forward/backward as far as it will go. The wheel and trigger go back to the neutral position. Once calibration is fininshed by press the bind key to save and exit.
   - If the calibration is completed successfully, the transmitter will exit calibration mode by pressing BIND button, meanwhile the buzzer will prompt with one short beep, and afterwards, the transmitter is in standby mode with the LED in three-flash-one-off state.
   - If the calibration is failure, the transimitter can not exit the calibration mode by pressing BIND button.

4.5 Power Off

Follow the steps below to turn off the system:

1. Disconnect the receiver power.
2. Toggle the transmitter's Power Switch to the OFF position.

⚠ **Danger**	• **Make sure to disconnect the receiver power before turning off the transmitter. Failure to do so may lead to damage or serious injury.**

5.System Functions

This section focuses on the functions and how to use them.

5.1 Channel Description

The transmitter outputs a total of 7 channels, the function assignment and settings are as follows.

Channel	Assigned Control	Function
CH1	Steering Wheel	Streeing
CH2	Thottle Trigger	Thottle
CH3	Three-position switch CH3	Fast-/slow-position servo channel Toggle the control to switch between fast-position and slow-position.
CH4	Button CH4	Output the CH4 value or switch the car light mode. Press for more than 2S to output the CH4 value. Press the control to switch the car light mode.
CH5	Button CH5	Four-wheel steering switching channel Used to set the wheels for controlling vehicle steering, i.e. front wheel steering, front and rear wheels steering in the reverse direction, front and rear wheels steering in the same direction, and rear wheel steering only. Suitable for partial crawlers with steering on both front and rear wheels. Switch to one state when pressing the control once. By default, it is the front wheel steering.
CH6	Button CH6	Differential lock servo channel. Enable/disable the differential lock function Press the control to enable/disable the differential lock function.
CH7	Button CH7	Enable/disable the winch function By default, it is disabled. Support the stretch or stop the winch. After pressing ON, press ST+/- button to change the winch operating speed. There are three levels in increasing/decreasing the speed respectively. You can choose the appropriate speed and the level as required. After the function is enabled, the winch function will be automatically shut down if you do not press the ST +/- button within 3 minutes.

5.2 Channel Reverse

To reverse the output direction of the channel.

- When the steering wheel is located in the maximum travel or minimum travel, press the REV kutton to reverse CH1. When you press once, it switches once.
- When the throttle trigger is at the maximum or minimum travel and the steering wheel is in the neutral position at the same time, press the REV button to reverse CH2. When you press once, it switches once. When the reverse action of the channel takes effect, the buzzer will sound shortly for prompt.
- When CH5 is set to rear wheel steering only, press the REV button to reverse CH5.

5.3 Trim Setting

To adjust the trim value of the channel.

- When the steering wheel is in the neutral position, press the ST+/- button to adjust CH1 trim.
- When the throttle trigger is in the neutral position, press the TH+/- button to adjust CH2 trim.
- When CH5 is set to rear wheel steering only, press the ST+/- button to adjust CH5 trim.

ST+/TH+: Increase the trim value. ST-/TH-: Decrease the trim value. Trim range: -150 us – 150 us; the step is 5us; by default, it is 0.

When the trim setting action takes effect, the buzzer will sound shortly for prompt. If you press and hold it, the value remains changes continuously. The buzzer will sound twice for prompt when the trim is across the neutral position.

Note: If the winch function is enabled, the trim remains unchanged when operating the ST+/- button.

5.4 D/R Setting

To adjust the travel range value of the channel.

- When the steering wheel is located in the maximum travel or minimum travel, press the ST+/- button to adjust CH1 travel value.
- When the throttle trigger is at the maximum or minimum travel, press the TH+/- button to adjust CH2 travel value.
- When CH5 is set to rear wheel steering only, press the ST+/- button to adjust CH5 travel value.

ST+/TH+: Increase the travel value. ST-/TH-: Decrease the travel value. Travel range: 0-120%, by default, it is 100%, the step is 5%.

When the travel setting action takes effect, the buzzer will sound shortly for prompt. If you press and hold it, the value remains changes continuously. The buzzer will sound long for prompt when reaching the endpoint.

Note: If the winch function is enabled, the trim remains unchanged when operating the ST+/- button.

5.5 Failsafe Setting

The failsafe function is used to protect the model and personnel when the receiver is out-of-control.

By default, the receiver will keep outputting the last channel value in case of out-of-control.

- When the transimitter is in normal working state, press and hold the BIND button for 3S to start the failsafe function. The current channel value is set as the failsafe value. The buzzer will sound long for prompt after the setting is successful.

Note: When the transmitter binds with a receiver once more, the failsafe setting will restore to default setting.

5.6 Reset Data

To reset the function data.

- Press and hold the BIND button and REV button while powering on the transmitter, to reset the function data, and the buzzer will sound long for prompt.

Note: The failsafe setting, binding information and stick calibration will not be reset.

5.7 Idle Alarm

The transmitter will go into idle alarm state when there is no operation over 10 minutes.

- When the transimitter is in idle alarm state, the transmitter LED is in gradual light state, the buzzer sounds twice quickly in cycle for prompt. Operations of any control on the transmitter will cancel the alarm, as a result of the exit of the idle alarm state.

5.8 Sleep Mode

When the transmitter has been in idle alarm state over 2 minutes, it will enter the sleep mode.

- In this mode, the transmitter LED is in gradual light state, the buzzer is off and the RF is off. The transmitter is not responsive in case of operations of any control. To exit the sleep mode, power off the transmitter and restart it.

5.9 Low Voltage Alarm

When the transmitter voltage has lower than 4.2V, it will enter the low voltage alarm state.

- When the transimitter is in low voltage alarm state, the transimtter LED will be in gradual status and the buzzer will sound shortly for prompt.

Note: The RF is off when the batteries voltage is lower than 3.5V for the model's and the system's safety.

5.10 Offline Prompt

When the transmitter is in normal state, once it detects the bound receiver has turned off, or disconnected over 2S, the transmitter LED will be in three-flash-one-off state for prompt.

Note: When the transmitter received the information of the bound receiver again, it will exit the offline prompt state.

6.FMS-R7A Function Instructions

This section instruct how to use FMS-R7A receiver and the attentions.

Note: Refer to 2.2 receiver overview for the information of the receiver's interfaces.

6.1 Attentions

- Make sure the product is installed and calibrated correctly, failure to do so may result in serious injury.
- Make sure the receiver's battery is disconnected before turning off the transmitter, failure to do so can result out of control. Unreasonable setting of the Failsafe may cause accidents.
- Make sure the receiver is mounted away from motors, electronic speed controllers or any device that emits excessive electrical noise.
- Keep the receiver's antenna at least 1cm away from conductive materials such as carbon or metal.
- Do not power on the receiver during the setup process to prevent loss of control.

6.2 Binding Instruction

If needs to rebind the receiver and the transmitter, refer to 4.3 Binding for details.

6.3 Protect Function

The receiver has low voltage protection and overheating protection function.

Low voltage protection: When the voltage of the receiver is lower than 6.4V, all channels have no output. All car lights flash promptly.

Overheating protection: When the internal temperature of the ESC is detected to exceed 110°C for 2S, CH2 motor channel has no output, the other channels output normally. And the normal output will be restored when the temperature is lower than 70°C .

6.4 Car Light Control

All car lights will be on for 1S when the receiver is powered on.

This receiver is preset with five modes for controlling model car lights. When the transmitter connects to the receiver normally, press CH4 button to change the working mode. One mode per press: Default Mode, Mode A, Mode B, Mode C and Mode D are switched in turn.

Note: When every time the transmitter is turned on, the mode of the car light control is default mode.

Light mode is as below:

Car Light	Default mode	Mode A	Mode B	Mode C	Mode D
Left light	Always off	Flashing slowly while turing left		Continous flashing slowly	Flashing slowly while turing left
Right light	Always off	Flashing slowly while turing right		Continous flashing slowly	Flashing slowly while turing right
Headlight	Always off	Solid low-light	Solid high-light		Always off
Brake light	High-light when braking, otherwise off	High-light when braking, otherwise in low-light state.			High-light when braking, otherwise off
Backup light	High-light when reversing, otherwise off				
Fog light	Always off			Solid on	

Notes：

1. The set mode is not save, that is, when every time the transmitter is turned on, the mode of the car light control is default mode.
2. Mode C is the emergency light state.
3. Steering CH1 and throttle CH2 can automatically identify the neutral position, that is, when the channel values of CH1 and CH2 are detected to be near the neutral position during power-on, the detected channel value will be regarded as the neutral value for controlling the car lights.

6.5 Idle Alarm setting

When the receiver detects that the transmitter channel value has not changed for more than 10 minutes, it will enter the idle alarm state.

In this state, the vehicle headlights and taillights (including brake light and backup light) are fast flashing alternatively for alerts.

Note: When the receiver has connected with the transmitter again, it will exit the idle alarm state.

6.6 Sleep Mode

When the receiver has been in idle alarm state over 2 minutes, it will enter the sleep mode.

In this mode, all channels have no output, and all car light are off.

Note: When the receiver detects the channel value has changed or has connected with the transmitter again, it will exit the sleep mode.

6.7 Offline Prompt

When the receiver has bound with the transmitter, once it detects the bound transmitter has turned off, or disconnected over 2S, all car lights will flashing slowly for prompt.

Note: When the receiver has connected with the transmitter again, it will exit the offline prompt state.

6.8 Failsafe

The receiver supports the failsafe function, it needs to be set at the transmittter side, refer to 5.5 Failsafe for details.

7. Specifications

This section contains FMS-G7 transmitter and FMS-R7A receiver specifications.

7.1 Transmitter Specifications

Product Model	FMS-G7
Compatible Receivers	FMS-R7A
Compatible Models	1:12, 1:10 simulation cars, climbing cars
Number of Channels	7
RF	2.4GHz ISM
Maximum Power	< 20dBm (e.i.r.p.) （EU）
2.4GHz Protocol	AFHDS 2A-BS
Distance	>100m (Ground distance without interference)
Resolution	1024
Input Power	6V DC or 1.5AAA*4
Working Current	10mA（static）；120mA/6V（dynamic）
Charging Port	No
Low Voltage Alarm	< 4.2V
Antenna	Built-in single antenna
Data Port	No
Temperature Range	-10°C ~ +60°C
Humidity Range	20% ~ 95%
Online Update	No
Color	Black
Dimensions	118*73*145mm
Weight	About 130g
Certifications	CE, FCC ID：N4ZMG400

7.2 Receiver Specifications

Product Model	FMS-R7A
Compatible Transmitters	FMS-G7
Compatible Models	1：12, 1：10 simulation cars, climbing cars
Applicable Motors	370 brushed motor
PWM Channels	7
Number of Lights	6
RF	2.4GHz ISM
2.4GHz Protocol	AFHDS 2A-BS
Input Power	2S Lithium batteries
Continuous / Peak Current	20A/80A
BEC Output	5V/1A
Maximum Power	< 20dBm (e.i.r.p.) （EU）
Distance	>100m （Ground distance without interference)
Antenna	External antenna
Data Output	PWM
Resolution	1024
Temperature Range	-10°C ~ +60°C
Humidity Range	20% ~ 95%
Online Update	No
Dimensions	32*24.4*12mm
Weight	8g
WaterProof	PPX4
Certifications	CE, FCC ID: 2A2UNR7A00

8. Package Contents

This section contains FMS-G7 transmitter package contents.

Number	Name	Quantity
1	FMS-G7 transmitter	1
2	FMS-R7A receiver	1

9. Certifications

9.1 DoC Declaration

Hereby, we declare that the Radio Equipment [FMS-G7&FMS-R7A] is in compliance with RED 2014/53/EU.

9.2 CE Warning

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

9.3 Appendix 1 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or televison reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example use only shielded interface cables when connecting to computer or peripheral devices).

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.

1. Move all your channels to the desired position.
2. Select [All channels] and then [Yes] in the confirmation box.

9.4 Environmentally friendly disposal

Old electrical appliances must not be disposed of together with the residual waste, but have to be disposed of separately. The disposal at the communal collecting point via private persons is for free. The owner of old appliances is responsible to bring the appliances to these collecting points or to similar collection points. With this little personal effort, you contribute to recycle valuable raw materials and the treatment of toxic substances.

Figures and illustrations in this manual are provided for reference only and may differ from actual product appearance. Product design and specificatiions may be changed without notice.

CE，FCC ID：N4ZMG400

Release date: 2022-09-20