R8FG V2.1

(FHSS)

INSTRUCTION MANUAL

Two-way Transmission
PWM&SBUS Signal Supported
8-channel Receiver with Integrated Gyro

Thanks for purchasing RadioLink 8-channel dual antenna receiver R8FG.

To fully enjoy the benefits of this product and ensure safety, please read the introduction carefully and set up the device as instructed steps.

If any problems found during the operation process, either way listed below can be used as online tech support.

1. Send mails to after_service@radiolink.com.cn and we will answer your question at the earliest.
2. Send private message to us on our Facebook page or leave comments on our YouTube page
3. If the product is purchased from the local distributor, you can also ask them for support and repair as prefer.

All manuals and firmwares are available on RadioLink official website www.radiolink.com and more tutorials are uploaded. Or follow our Facebook and YouTube homepage to stay tuned with our latest news.

Facebook **YouTube**

SAFETY PRECAUTIONS

- Never operate your model during adverse weather conditions. Poor visibility can cause disorientation and loss of control of your model.
- Never use this product in a crowd and illegal area.
- Always ensure the trim levers at 0 and battery properly charged before connecting the receiver.
- Always check all servos and their connections prior to each run.
- Always be sure about turning off the receiver before the transmitter.

WARNING

This product is not a toy and is **NOT** suitable for children under the age of 14. Adults should keep the product out of the reach of children and exercise caution when operating this product in the presence of children.

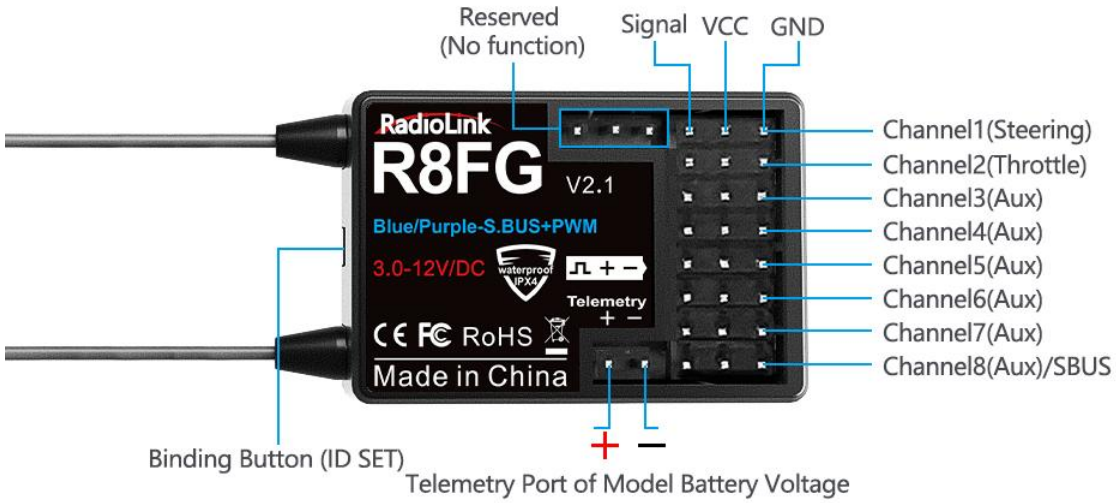
Water or moisture may enter the transmitter inside through gaps in the antenna or joystick and cause model instability, even out of control. If running in the wet weather(such as game) is inevitable, always use plastic bags or waterproof cloth to cover the transmitter.

Contents

1. R8FG Introduction

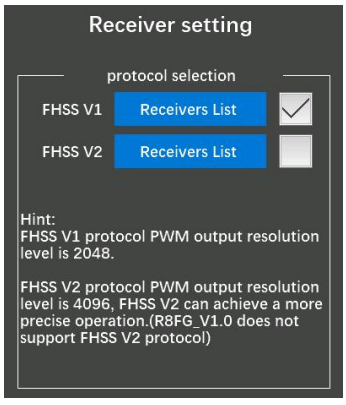
RadioLink R8FG 2.4G 8-channel receiver, splash-proof, with integrated gyro for professional car drifting and high voltage servo supported

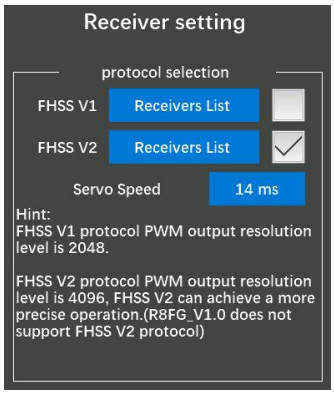
R8FG receiver is compatible with RadioLink RC8X/RC6GS V3/RC4GS V3/RC6GS V2/RC4GS V2/RC6GS (3-position switch version)/RC4GS (version with P.D AFTER 180101) /T8FB(BT) /T8S(BT)/T8FB(OTG)/T8S(OTG) transmitters.



2. Receiver Protocol Selection

If you are using R8FG with RC8X transmitter, please select correct receiver protocol in RC8X first and then bind them. Enter the "Basic Menu" - "Receiver setting" of RC8X and then select FHSS V1 or FHSS V2 protocol (as shown below). FHSS V1 receivers have a PWM output resolution of 2048, and FHSS V2 receivers have a PWM output resolution of 4096. The higher the resolution, the more delicate the angle of servo motion.

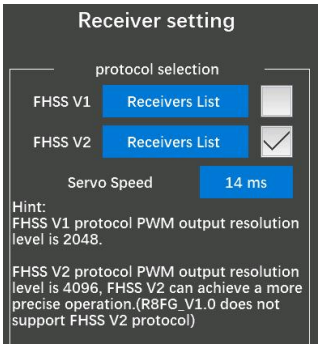




Please click "Receivers List" (as shown above) to check whether the receiver you are currently using belongs to FHSS V1 or FHSS V2 protocol list. R8FG V1.0 (production date before Feb. 6, 2023) only supports FHSS V1 protocol, not FHSS V2 protocol; R8FG V2.0 and later versions (production date on or after Feb. 6, 2023) support FHSS V1 and FHSS V2 protocol. Before operating the model, please make sure protocol of the receiver is selected correctly, otherwise some functions will not work properly.

3. Servo Speed Setting

When FHSS V2 protocol is selected in RC8X, servo Speed will appear on the screen (as shown below).



Servo Speed setting method:

(1) Transmitter: It is necessary to update the RC8X firmware to V1.1.5 or above, and then select FHSS V2 protocol to display this option. Servo speed can be selected from 14ms, 4ms, and 3ms. The default servo speed is 14ms (analog servo speed), 4ms and 3ms (digital servo speed).

(2) Receiver: If you are using a digital servo, you need to choose a servo speed of 4ms or 3ms. Please confirm whether the receiver you are using supports digital servo. Currently, R8FG V2.1 and R8FG with a factory date of 2023/4/26 and later support digital servo. Previous versions of R8FG, such as R8FG V1.0, does not support digital servos. Even if 4ms or 3ms is selected when using it, the default servo speed is 14ms.

(3) Status indication: When switching the servo speed, the green LED light of the receiver will flash twice, which means that the switching of the servo speed is successful; if the green LED of the receiver does not flash when switching the servo speed of the servo, it means that the switching of the servo speed of the servo is unsuccessful or the current receiver does not support digital servos.

4. Binding

Each receiver has an individual ID code and must bind with transmitter before using. When the binding is done, the ID code will be stored in the transmitter and there's no need to rebind. Therefore, when a new R8FG is purchased, binding needs to be done in order to work with transmitter.

Binding steps:

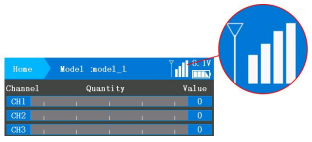
(1) Select the correct receiver protocol in RC8X (please refer to Chapter 2. Receiver Protocol Selection)
Note: If you are using a transmitter other than RC8X, such as RC6GS, RC4GS, etc., go to step 2 directly.

(2) Put the transmitter and the receiver close to each other (about 60 centimeters).

(3) Turn on both the transmitter and the receiver, and then the LED of R8FG will start flashing slowly.

(4) There is a black binding button (ID SET) on the side of the receiver. Press the button for more than 1 second and release, the LED will flash quickly, indicating the binding process is ongoing.

(5) When the LED stops flashing and is always on, binding is complete and there will be a signal tower shown on top of the IPS screen of the transmitter(As shown on the right). If not successful, the LED will keep flashing slowly to notify, repeat the above steps.



Note:

1. When the transmitter and receiver are powered on, if binding is not successful or the signal is lost, the LED of R8FG will keep flashing to notify.

2. The close distance between the transmitter and receiver may cause a signal block, which leads to unsuccessful binding or signal loss. After the binding is successful, if RC8X and R8FG receiver are too close (for example, within 60 centimeters), the signal may also be lost because of signal block. Bring RC8X transmitter and R8FG receiver farther apart, the signal loss will disappear automatically.

5. Telemetry

R8FG can return the real-time flight information such as RSSI, receiver voltage and model battery voltage.

In order to enjoy this function, please upgrade **RC6GS(3-position switch version)** with the firmware **RC6GS_RadioLink_bin_1d15_V_6_1_2** downloaded via https://www.radiolink.com/rc6gs_firmware

Or upgrade RC4GS(produced after 2018-01-01) with the firmware **RC4GS_RX_RadioLink_bin_2f50_V_6_0_1** downloaded via https://www.radiolink.com/rc4gs_firmware

If you are using RC8X, RC6GS V3, RC6GS V2, RC4GS V3 or RC4GS V2, the default firmware supports telemetry function.

Power on RC8X and R8FG receiver. The signal and other telemetry information will be displayed in the home page of RC8X if the binding is successful and the telemetry cable is connected correctly.

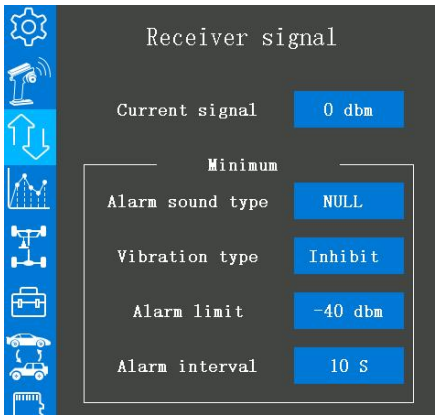
RC8X home page:

5.1 Telemetry of Signal and RSSI

Power on RC8X and R8FG receiver, and then bind them. Signal and RSSI will be displayed on the homepage of transmitter after successful binding.

RC8X home page:

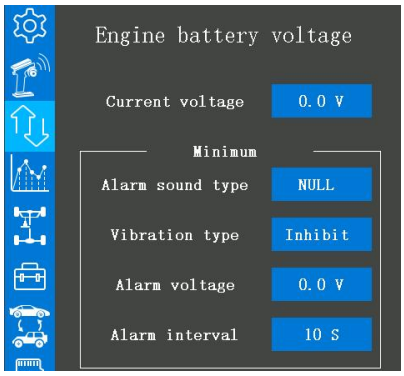
Warning can be set with a certain low RSSI value after testing by changing distance. Enter Telemetry setting--Receiver signal to set the RSSI warning value, alarm sound type etc..



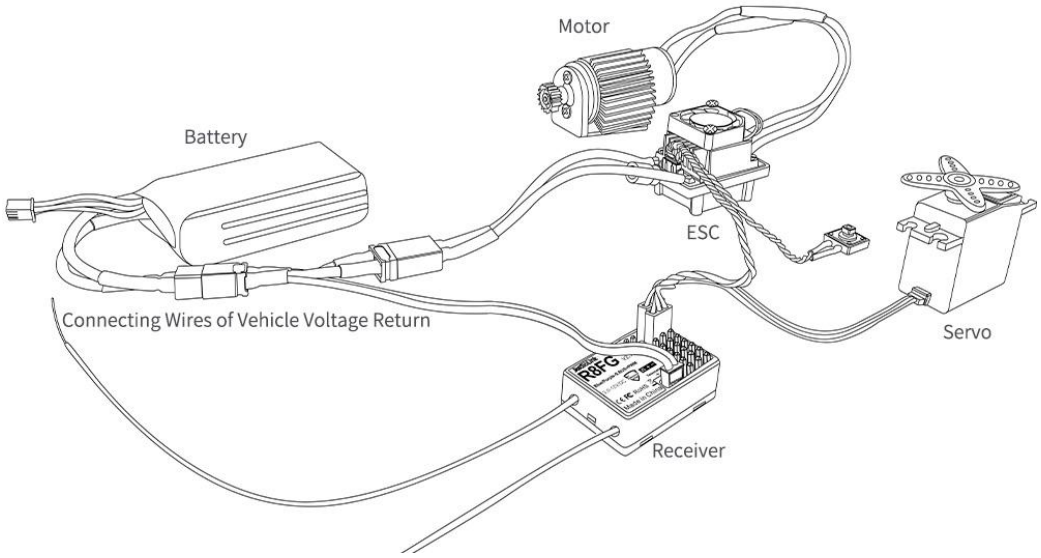
Note: R8FG is the receiver with dual antenna. When the distance between the transmitter and the R8FG is 60 centimeters, it is normal that RSSI value is within the range of 0 to -30dBm. The closer the value is to 0, the stronger the signal is. The range of RSSI value of RadioLink transmitters is from 0 to -99dBm. The larger the absolute value of the RSSI value is, the weaker the signal is. For example, the signal when the RSSI value is -90dBm is weaker than the signal when the RSSI value is -75dBm.

5.2 Telemetry of model battery and receiver voltage

Besides the return of receiver voltage, model battery voltage (maximum up to 8S lithium battery, 33.6V) can also be returned in real time. Users can personalize the warning value of low model battery voltage depending on the actual needs Enter Telemetry setting-- Engine battery voltage to set the alarm voltage, alarm sound type etc.. Normally we set the warning value with the single cell voltage as 3.7V. For example, if it is 3S lithium battery used in the model car, the warning value should be set as （3.7V*3S=）11.1V.



Model battery voltage return can be easily achieved by connecting the male end of the battery wire to ESC while the female end to the battery and the wire with a JST head connects Telemetry (+-) port of R8FG/R7FG/R8F as below pic shown. No extra module is needed.



Attention:

1. Reverse polarity protection circuit design for all 8 channels of R8FG ensures vital components are protected from a reverse polarity connection. But, the JST connector which is packed with R8FG for connecting to the battery cannot reverse polarity connect, or it will lead to the wrong voltage value telemetry.
2. Telemetry port is only used to model voltage telemetry. It can not be used to power the receiver.

6. Subsidiary ID

RC8X can bind with multiple receivers. When RC8X and multiple receivers have been bound successfully, and RC8X and all successfully paired devices are turned on at the same time. There are two ways to use them:

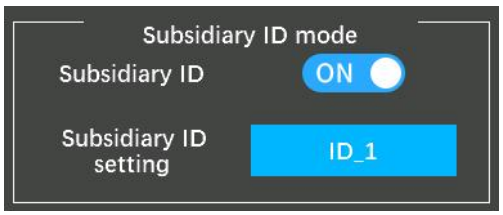
1. When Subsidiary ID function is turned off, RC8X can control multiple devices at the same time.
2. When Subsidiary ID function is turned on, RC8X can control the specified device according to the selected Subsidiary ID. RC8X has 16 groups of Subsidiary ID functions, and each ID corresponds to a receiver. Set the Subsidiary ID first. When all the devices are turned on, you can control one of the devices through the Subsidiary ID function. At this time, the other devices are on standby.

For example: Bind RC8X with a truck and a car and turn all them on. First, use RC8X to control the

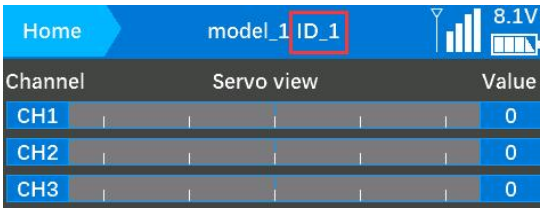
car to run to the bucket of the truck, and then switch the receiver ID on the truck to drag the car back to the destination.

Subsidiary ID mode setting steps:

1. Tap the button at the right of the "Subsidiary ID mode" to change it from "OFF" to "ON". Set the ID number according to your cars or boats and then finish the bind and parameters set for each receiver.



2. Once finished the Subsidiary ID mode setting, the corresponding ID number will be displayed on the main interface of RC8X. (For example: ID_1) Change the ID number by click "-" or "+", click Reset will make the ID number back to ID_0.



7. Working Modes

R8FG has a built-in gyroscope, which can output not only PWM signals but also SBUS signals. There are four working modes, including ordinary PWM mode, SBUS mode, Gyro mode, and Gyro + SBUS mode. The channel signal corresponding to each mode is as follows:

R8FG Working Mode						
Working Mode		PWM Mode	SBUS Mode	Gyro mode	Gyro+SBUS Mode	Note
Channel	Telemetry	Telemetry Port of Model Battery Voltage (+ -) TELEMETRY port is only for 2S-8S battery voltage telemetry. The port cannot be used to power the receiver.				
	1	PWM	PWM	PWM	PWM	Steering
	2	PWM	PWM	PWM	PWM	Throttle
	3	PWM	PWM	PWM	PWM	Aux
	4	PWM	PWM	PWM	PWM	Aux
	5	PWM	PWM	PWM	PWM	Aux
	6	PWM	PWM	PWM	PWM	Aux
	7	PWM	PWM	PWM	PWM	Aux
	8/SBUS	PWM	S.BUS	PWM	S.BUS	Aux

7.1 Working mode setting

Turn on/off the gyro: Short press the binding button 3 times within 2 seconds to switch the gyro on and off, and the color of the LED indicator will switch accordingly
Gyro phase switch: Short press the binding button twice within 2 seconds to switch the gyro phase.
Turning on/off the SBUS: short press the binding button once to turn on/off the SBUS, and the color of the LED indicator will switch accordingly. After SBUS signal is enabled, channel 1-7 output PWM, and channel 8 outputs the SBUS signal.

7.2 LED Indicator Color in Different Working Modes

Working Mode	PWM Mode	Gyro mode	SBUS Mode	Gyro + SBUS Mode
Indicator Color	Green	Red	Blue	Red+Blue

Note: When the receiver is connected to the power supply, if there is no successful binding between the receiver and the transmitter or the receiver loses the signal, the indicator of the receiver will flash slowly.

8. Gyro Introduction

8.1 Gyro Function

R8FG has a built-in gyroscope. The integrated high-performance gyro adopts the software filter and PID algorithm, timely and precisely corrects the sensitivity and improves the stability. Its good flexibility to different models easily achieves professional performance even with drift cars.

8.2 Gyro Enable

The gyro function of R8FG is turned off by default. Since the integrated gyro in R8FG will self-check, it is important to keep R8FG still when powering it on. Red LED is the gyro status indicator . When the red LED off means NO gyro. Press the binding button three times (intervals of less than 1 second), the red LED will flash three times, indicating that gyro is enabled.

Attention: It's normal that the servo keeps shaking when connected to the receiver. Because the gyro is helping to correct the steering gear angle of the servo automatically if the gyro function has turned on, you can turn off the gyro function if you do not need this function.
If the receiver has not to be moved, but the servo keep shaking, there are two reasons below:
① The servo has connected to the SBUS channel of the receiver. Please reconnect the servo to the CH1/2/3/4/5/6/7, because the standard servo only supports PWM signal input.
② The gyro is too much sensitive. Please turn DL1 switch to reduce the gyro sensitivity.

8.3 Gyro Reverse

Set the gyro forward, and turn the car right or left to see whether the gyro functions. The wheel will turn left when the car is turned right and the wheel turns right when the car is turned left. If the gyro acts counter, press the binding button twice, the red LED flashes twice, the gyro reverse is corrected.

8.4 Gyro Sensitivity Adjustment

Gyro sensitivity is defaulted to adjust by channel eight that default controlled by DL1/PS3 knob switch, turning the DL1/PS3 knob switch clockwise to increase sensitivity and anti-clockwise to reduce it. When turning the DL1/PS3 knob switch, a tooltip with yellow background color will pop out at the top of the screen, and the value of the channel will be changing at the same time, the value is closer to +100, the higher sensitivity. If the value is 0, it means the gyro function has been turned off.

You can also assign other switches to control the gyro function or adjust the sensitivity on this page.

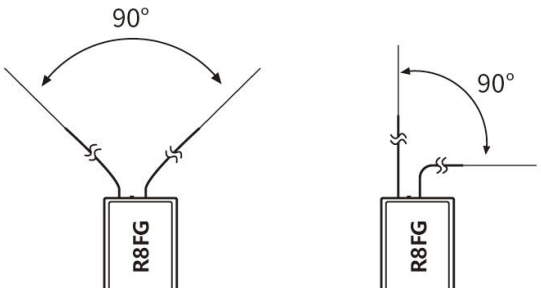
9. R8FG Specifications

R8FG Receiver	
Dimension	L*W*H =35*24*13.5mm (1.38"*0.94"*0.53")
Weight	10.5g (0.37oz)
Channel	8 channels
Antenna Length	205mm (8.07")
Control Distance	Ground 600 meters (1968.5ft) (Maximum range tested in unobstructed areas free of interference)
Operating Current	35mA (5V)
Operating Voltage	3-12V
Signal Output	SBUS&PWM
Telemetry	Real-time built-in telemetry of model battery voltage, RSSI, and receiver voltage
Gyro	Receiver with gyro integrated, customizable gyro sensitivity
Water Splash Proof	The waterproof grade is IPX4
Response Latency	3ms, 4ms, 14ms can be selected (If you want to select 3ms or 4ms digital servo speed, make sure it is R8FG V2.1, or R8FG receiver with a factory date of 2023/4/26 and later)
Compatible Transmitter	RC8X/RC6GS V3/RC4GS V3/RC6GS V2/RC4GS V2/RC6GS (3-position switch version)/RC4GS (version with P.D AFTER 180101) /T8FB(BT)/T8FB(OTG)/T8S(BT)/T8S(OTG)

10. Note of Antenna Installation

In order to maximize the signal transmission, it's greatly advised that

1. Keep antennas as straight as possible, or the effective control range will reduce.
2. Keep the two antenna in 90° angle as shown below



3. Big models may contain metal parts that influence signal emission. In this case. antennas should be positioned at both sides of the model to ensure the best signal status in all circumstances.
4. Antennas should be kept away from metal conductor and carbon fiber at least half inch away and no over bending.
5. Keep antennas away from motor, ESC or other possible interference sources.
6. Sponge or foam material is advised to use to prevent vibration when installing receiver.
7. Receiver contains some electronic components of high-precision. Be careful to avoid strong vibration and high temperature.
8. Special vibration-proof material for R/C like foam or rubber cloth is used to pack to protect receiver. Keeping the receiver in a well sealed plastic bag can avoid humidity and dust, which would possibly make the receiver out of control.

Thank you again for choosing RadioLink product.