

## Introduction

The Archer line of receivers has been enhanced further with the addition of the new Archer Plus Series. The Archer Plus Series receivers include some new features. Firstly, an enhanced anti-RF-interference capability can offer a more solid and stable RF performance. These AP series receivers also with both ACCESS and ACCST D16 modes, where the RF protocol is smartly matched during the binding process on the radio. In ACCESS mode, these receivers not only feature OTA wireless firmware upgrades, increased range, and telemetry performance, they also support even more functions like configurable telemetry power and protocol switching(S.Port/F.Port/FBUS).

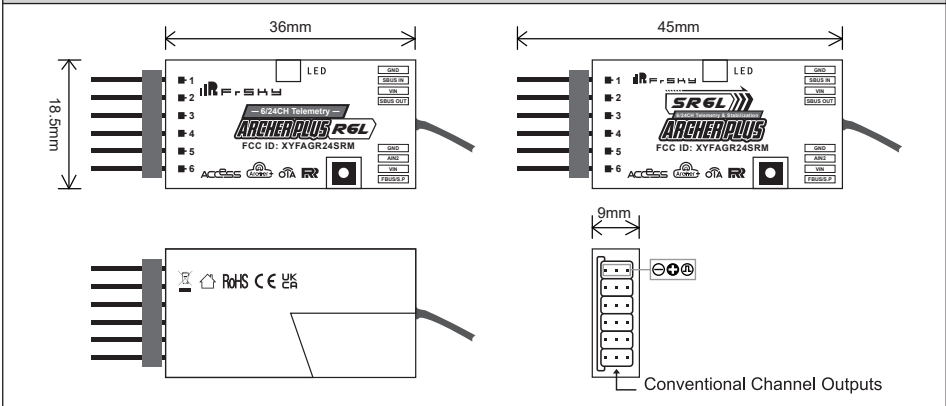
The AP Lite-series 6-channel receivers feature a compact layout design in functions and are equipped with a 2.4G signal antenna. These receivers have 6 of regular 3-Pin PWM signal output connectors on one end, and can offer multiple function ports through SBUS In/Out, S.Port/FBUS, and AIN on the other end. By using the included connector adapter cable, users can achieve those functions for different system buildings with flexible feature combinations.

Through the specific S.Port cable, the receivers can be easily connected to a transmitter with an S.Port for the firmware upgrade, or sensors for the telemetry. When the S.Port is set to FBUS mode through the ETHOS system, the setting features of all FBUS-capable devices in the link can now be directly configured through the ETHOS system using Lua script tools, and in FBUS mode, the receivers can output 24 signal channels in total.

The SR6L receivers are gyro-stabilized receivers with a built-in 3-axis gyroscope and 3-axis accelerometer and feature multiple flight modes (Auto-level, Stabilization, Knife-Edge, etc.). The stabilization mode has been enhanced with another set of stabilized channel groups (5 additional stabilization channels), providing pin mapping to each channel in the multiple flight modes.

(\*Some features require the support of ACCESS and ETHOS.)

## Overview



## Specifications

- Dimension: 45\*18.5\*9mm (L\*W\*H)
- Weight: 5.6g
- Number of Channels: 6/24 channels
- Operating Voltage Range: 3.5~10V
- Operating Current: <65mA@5V
- Operating Range: >2km (Full range) (\*Range may vary based on local conditions.)

- Variometer Measurement Range (AP SR6L)  
Altimeter Range & Resolution: -700m to 10000m & 0.1m  
Vertical Speed Range:  $\pm 10\text{m/s}$
- Voltage Measurement Range via AIN2 (External device): 0-35V (Battery Voltage Divider Ratio: 1:10)
- Antenna Connector: IPEX1
- Compatibility: FrSky 2.4GHz ACCESS / ACCST D16 capable transmitters

## Features

- Enhanced Anti RF-Interference Capability with More Solid RF Performance
- Smart-matched ACCESS & ACCST D16 modes
- Built-in Stabilization Functions (Archer Plus SR6L)
- Built-in High-Precision Telemetry Sensor (Altitude, Vertical Speed, etc.) (Archer Plus SR6L)
- 6 High-precision PWM Channel Ports
- SBUS Out Port (Supports 16CH/24CH mode)
- SBUS In Port (Supports Signal Redundancy)
- Full Control Range with Telemetry (FBUS/F.Port/S.Port)
- Over-The-Air (OTA) Firmware Update
- External Battery/Device Voltage Detection

## LED State

Green LED	Red LED	Status
On	On	Register
Flash	Flash	Register successfully
Flash	On	Bind
On	Off	Bind successfully
On	Off	In working
Off	On	Failsafe

Blue LED	State (Calibration of Accelerometer)
ON	exceeding limits (0.9G, 1.1G)
OFF	In normal status
Flash	Calibration is completed

## Registration & Automatic Binding

Follow the step below to finish the registration & binding procedure:

1. For ETHOS radios as an example, enter into the Model, select RF System, turn on the internal module, select status [ON] and ACCESS, then determine the antennas (internal or external) and choose the RF power according to the actual usage, the ACCESS receiver can be registered to the radio at the moment. (Notice: the "Registration" process is not required while binding the receiver in ACCST D16 mode.)
2. Connect the battery to the receiver while holding the button on the receiver. The RED LED and GREEN LED on the receiver will be on, indicating into the [Reg] status.
3. When it shows the Register ID, RX name and UID, click [Register]. The RED LED and GREEN LED on the receiver will flash, and the transmitter displays [Registration OK].
4. Power off the receiver.
5. Move the cursor to select any one of the 3 receivers and press [Bind].
6. Connect the battery to the receiver.
7. Select the RX, the GREEN will keep lit, then the transmitter displays [Bind successful].

**Note:** Once the receiver is registered, the register process is not needed anymore in the binding process (ACCESS mode).

## Stabilization Functions (AP SR6L)

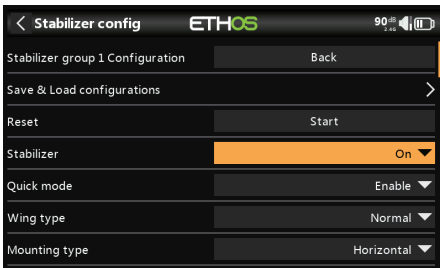
## Basic Step Guides

## ⚠ Preparation:

- ETHOS V1.6.1 (or later version) is required.
  - Stabilizer Config V3.0.10 (or later version) is required.
- a. Ensure stabilization is enabled & Complete the 6-axis calibration for the gyroscope;
  - b. Servo connection & Build the stabilization device to the model;
  - c. Set up the mixer channels and input controls;
  - d. Determine the [Wing Type] & [Mounting Type];
  - e. Gain and Offset settings for stabilized flight modes;
  - f. Stabilized channel output checks in Auto-Level mode;
  - g. Radio stick control checks in Manual mode;
  - h. Calibration (Level, Stick Center & Range) for Stab Group 1 & 2
  - i. Angle Mode - Roll/Pitch Degree Configuration (Optional)

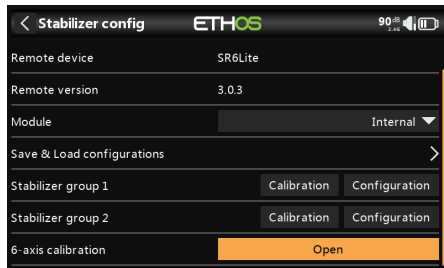
**Note:** Please move to the [ETHOS Suite] > [Lua library] > [StabilizerConfig] section to download the latest functional Lua scripts (Place the decompressed Lua folder in the root directory of the [Scripts] folder on the memory card to use.)

## a. Gyroscope Sensor Calibration



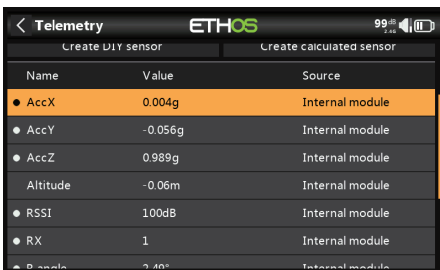
[Device Config] > [Receivers] > [Stabilizer Config]  
> [Stabilizer Group / Configuration] > [Stabilizer / On]

**Step 1** Ensure the Stabilizer Status is On for both Stabilizer Group 1 and 2.



[Device Config] > [Receivers] > [Stabilizer Config]  
> [6-axis calibration / Open]

**Step 2** Complete the 6-axis calibration for the gyroscope.



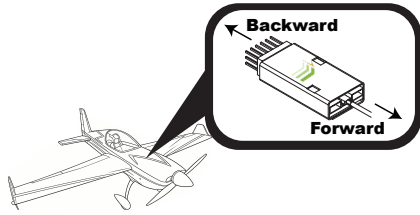
## ⚠ Gyroscope Calibration Notes

The gyroscope of device (6 surfaces) must be calibrated before mounting into the model. Please place the device on a flat ground or a table, and follow the steps to calibrate the gyroscope sensor.

Once completing the calibration of all the device surfaces, the accelerometer telemetry values of each axis (AccX, AccY and AccZ) is about 1.000 gravity while placing the device in the corresponding direction, and the deviation could be  $\pm 0.1$ .

## b. Servo connection &amp; Build the device to the model

Stabilized Device Mounting Orientation



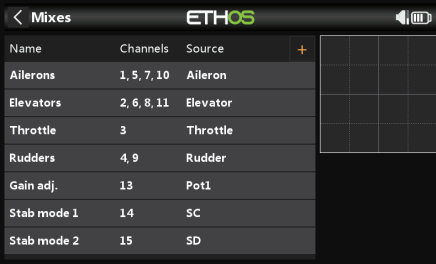
Connect the servos to the ports of the stabilization device according to the Channel List.

**Note:** Please make sure the label upwards and the antenna forwards the nose direction of airplane model.

Number of Channel	Corresponding parts on the model	Full name
CH1	AIL 1	Aileron
CH2	ELE 1	Elevator
CH3	THR	Throttle
CH4	RUD	Rudder
CH5	AIL 2	Aileron
CH6	ELE 2	Elevator
CH7	AIL 3	Aileron
CH8	ELE 3	Elevator
CH9	RUD 2	Rudder
CH10	AIL 4	Aileron
CH11	ELE 4	Elevator
CH12	User-defined	
CH13	User-defined	Gyro gain adjustment
CH14&CH15	User-defined	Flight modes

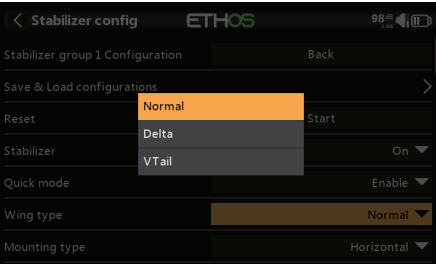
Gyro gain adjustment of CH13: When the the value of CH13 is in the center, the gain is zero. The gain increases as the value get bigger. The gain reaches maximum when the value is getting  $\pm 100\%$ .

### c. Set up the Mixer channels & Input Controls (on radios)

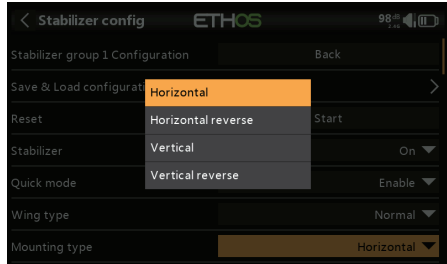


Refer to the illustration to set the channel and input controls (switches, potentiometers, sticks, etc.). The Input settings of CH13-15 on the picture is for reference.

### d. Determine the Wing Type & Mounting Type.

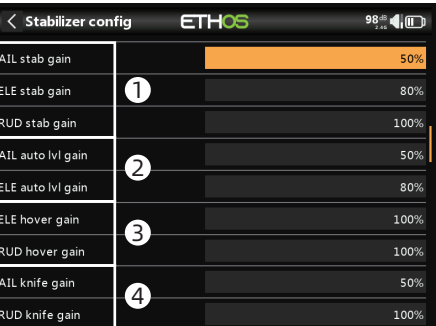


Wing Type ▷ [Normal / Delta / VTail]

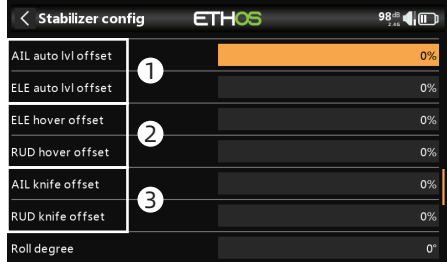


Mounting Type ▷ [Horizontal / Horizontal reverse / Vertical / Vertical reverse]

### e. Gain and Offset settings for stabilized flight modes.



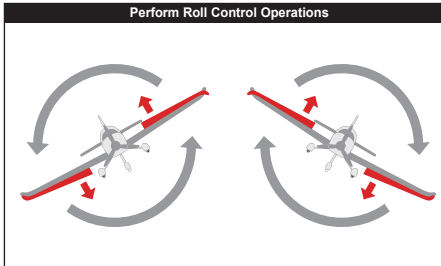
- ① Gain - Stab Mode
- ② Gain - Auto-Level Mode
- ③ Gain - Hover Mode
- ④ Gain - Knife Mode



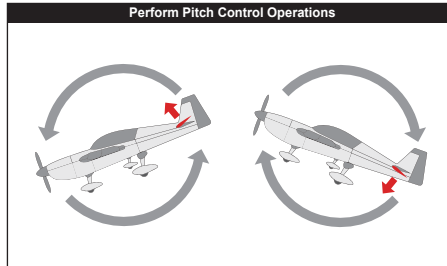
- ① Angle Offset - Auto-Level Mode
- ② Angle Offset - Hover Mode
- ③ Angle Offset - Knife Mode

## f. Stabilized channel output checks in Auto-Level mode

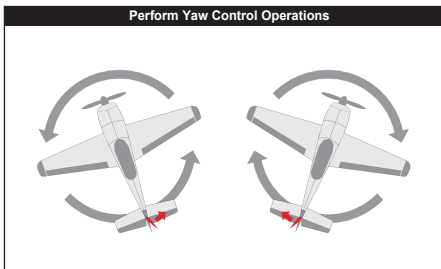
To ensure flight safety, it is strongly recommended to check the movement directions of the model's stabilized channel outputs. Activating Auto-Level mode will cause significant deflection on the stabilized AIL and ELE channels, allowing you to verify the responses of the aileron and elevator. Similarly, activating Knife-Edge and Hover modes will produce the same response on the rudder.



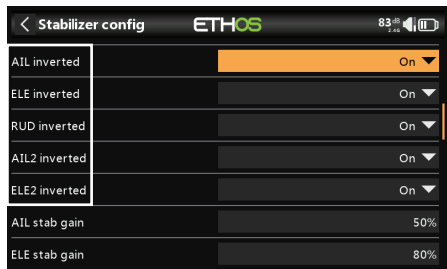
When the plane is rotated left or right (Roll), ailerons should have the correcting actions as illustrated.



When the plane is rotated up or down (Pitch), elevators should have the correcting actions as illustrated.



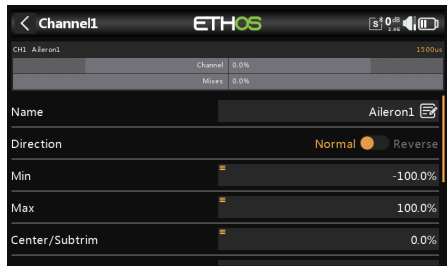
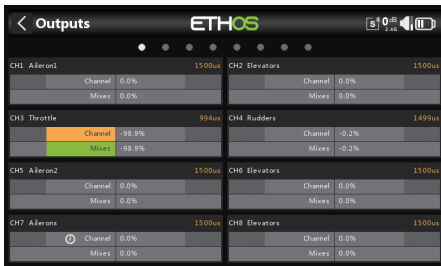
When the plane is rotated to left or right (Yaw), rudders should have the correcting actions as illustrated.



Check whether the wing servo movement is in line with the flight attitude caption above in the [Auto-Level] mode. If not, please try to invert the corresponding channel output in the [Stabilizer config] tool.

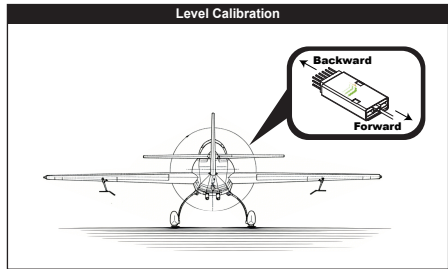
## g. Radio stick control check in Manual mode

Check whether the wing servo movement is in line with the radio stick operation in the [Manual] mode. If not, please try to invert the corresponding channel output by pressing the channel bar in the [Output] tool.



[ETHOS] > [Model] > [Outputs]

## h. Calibration (Level, Stick Center & Range) for Stab Group 1 & 2



[ETHOS] > [System] > [Device Config] > [Receivers] > [Stabilizer Config] > [Stabilizer group 1/2] > [Calibration]

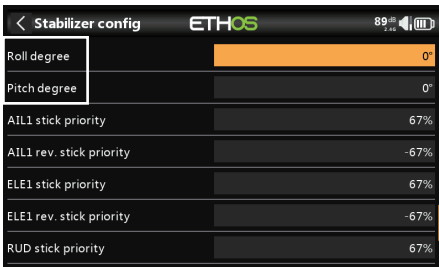
Please place the model in a level position, then press OK to continue.



Please set the stick to the center position, then press OK to continue.

Please move the stick to its full range in all direction to calibrate.

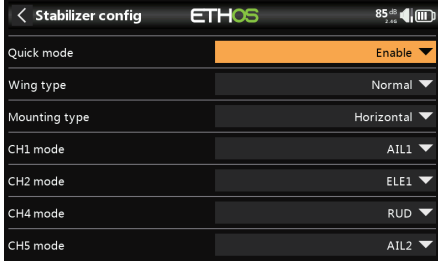
## i. Angle Mode - Roll/Pitch Degree Configuration (Optional)



[ETHOS] > [System] > [Device Config] > [Receivers] > [Stabilizer Config] > [Stabilizer group 1/2] > [Configuration] > [Roll/Pitch Degree]

Once the Roll/Pitch degree is configured, the Auto-Level mode will switch to Angle mode. The movement angle of Roll and Pitch for Angle mode can be configured up to 80 degrees. This feature will not be activated if the degree value is set to 0-9. The setting with the Roll/Pitch degree between 10 to 80 can have the feature work, and it's not recommended to be set with the degree values too small.

## Quick Mode



[ETHOS] > [System] > [Device Config] > [Receivers] > [Stabilizer Config] > [Stabilizer group 1/2] > [Configuration] > [Quick Mode]

The Quick Mode supports Stabilization mode, Auto-Level mode, and Manual (Gyroscope is off) mode and configured through CH14. The CH15 cannot be used when using Quick Mode.

**Note: The Quick Mode is enabled by default. Once the Quick Mode is On, there is no Knife Edge or (3D) Hover Mode.**

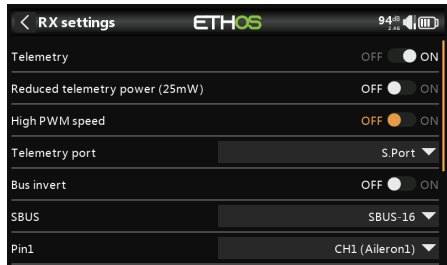
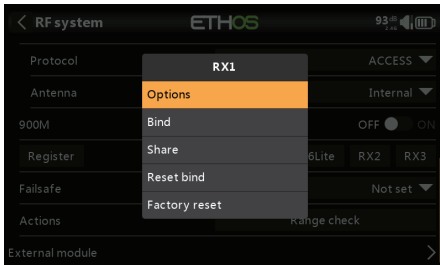
Channel	Position	Flight Mode
CH14 (3 pos SW)	SW Down	None
	SW Mid	Stabilization Mode
	SW Up	Auto-Level Mode

## High PWM Speed / 25mW Telemetry Power settings

- The factory default setting is OFF .
- 1 To go to the receiver [Options], select On to active high speed mode .

**Warning: High PWM speed mode is only applied for digital servos. Turn off High PWM Speed mode when using analog servo, otherwise servos will get hot and may burn out.**

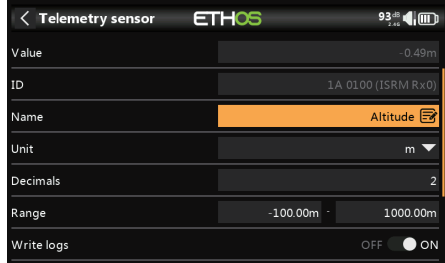
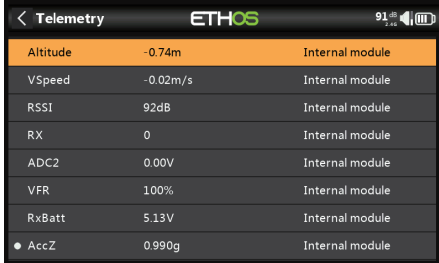
- 2.2 To go to the receiver [Options], select On to active 25mW telemetry mode .



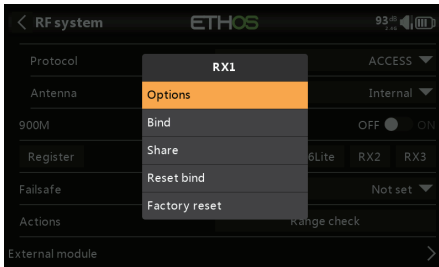
[ETHOS] > [Model] > [Internal/External Module] > [Receiver (Model)]

## Altitude / VSpeed (Vertical Speed) Telemetry Settings (AP SR6L)

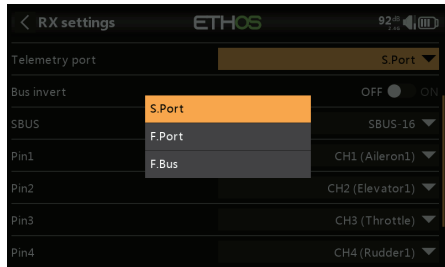
1. Bind the receiver with the built-in variometer sensor to the transmitter.
2. Enter [Model] menu and use [Telemetry] tool.
3. Discover new sensors and then the [Altitude] data should keep flashing in the list.
4. Holding the [Altitude] bar can call the [Edit] menu out.
5. The telemetry data like [Range] and [Unit] of the variometer can be set now.



## How to switch the S.Port/F.Port/FBUS

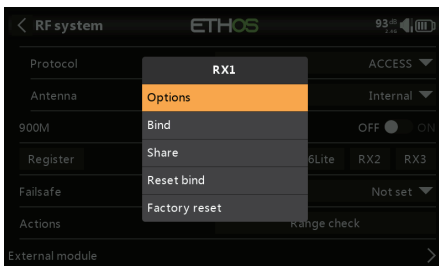


Enter into the [Set] of receiver.

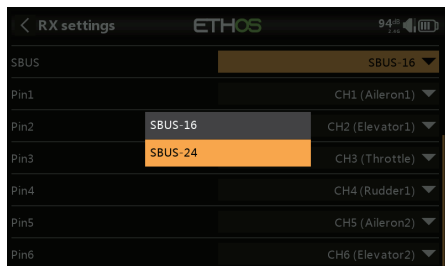


Click the Telem.Port, and select S.Port/F.Port/FBUS.

## How to switch SBUS-16/-24 mode



Enter into RX Settings.



Click [SBUS], then select SBUS-16 mode or SBUS-24 mode.

## About OTA function

Go to the [File manager], and select the FW, press the enter button, select [Flash RX by int.OTA]. Power on the receiver, select the RX, go to the [ENTER], complete the flash process, the transmitter will display [Success]. Wait for 3 seconds, the receiver works properly at the moment.

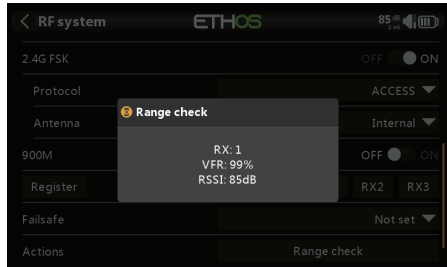
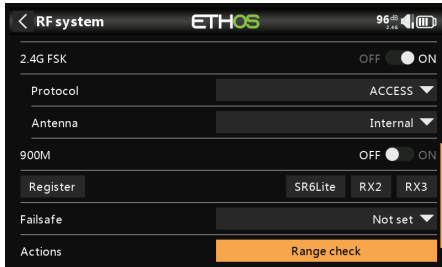
**Note: Please do not do the binding operation in the near range while the firmware upgrading in progress.**

**Note: Update the firmware after the receiver getting registered (OTA).**

## Range Check

A pre-flight range check should be done before every flight, in case the signal loss is caused by the reflection of the signal by the nearby metal fence or concrete, and the shading of the signal by buildings or trees during the actual flight.

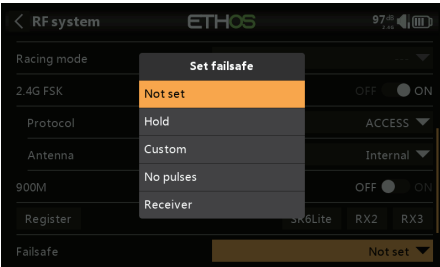
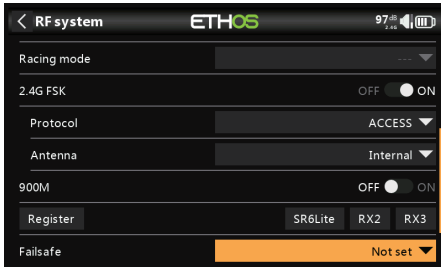
1. Place the model at least 60 cm (2 feet) above the non-metal contaminated ground (such as on a wooden bench). The receiving antenna should be in a vertical position.
2. Enter the ETHOS system, move to the "RF System", scroll the Encoder to select "RANGE" mode and press Encoder. In range check mode, the effective distance will be decreased to 1/30.



## How to set Failsafe

There are 3 failsafe modes when the setting is enabled: No Pulse, Hold, and Custom mode.

- **No Pulses Mode:** On loss of signal, the receiver produces no pulses on any pwm channel. To use this mode, select it in the menu and wait 9 seconds for the failsafe to take effect.
- **Hold Mode:** The receiver continues to output the last positions before the signal was lost. To use this mode, select it in the menu and wait 9 seconds for the failsafe to take effect.
- **Custom Mode:** Pre-set to required positions on the lost signal. Move the cursor to the failsafe mode of the channel and press Encoder, then choose the Custom mode. Move the cursor to the channel you want to set failsafe On and press Encoder. Then rotate the Encoder to set your failsafe for each channel and short-press the Encoder to finish the setting. Wait 9 seconds for the failsafe to take effect.



### Note:

- **If the failsafe is not set, the model will always work with the last working status before the signal is lost. That could cause potential damage.**
- **When the failsafe is disabled on the RF module side, the receiver defaults to Hold mode.**
- **When in No Pulses Mode, do not set the Failsafe to No Pulses Mode for the SBUS port as it will keep the signal output continuously, Please set "Hold" or "Custom" mode for the SBUS port.**

## FCC STATEMENT

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - 1) This device may not cause harmful interference.
  - 2) This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 transmitter frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to transmitter communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to transmitter or television 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 transmitter/TV technician for help.