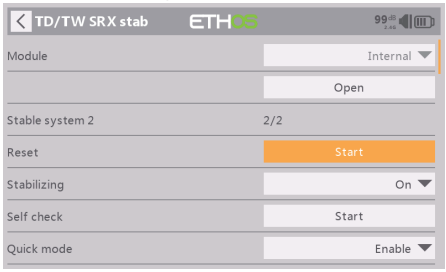
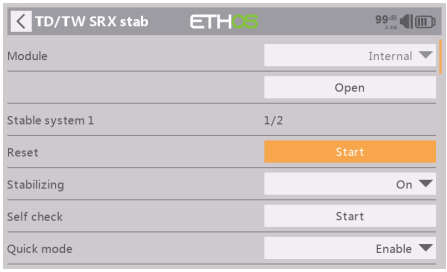
Preparations

- Please ensure you are using the latest Lua scripts (v3.0.0 or later versions) instead of the older Stab Lua tools or the Stab tools in Device Config (ETHOS's integration).
- Required firmware versions of Stab capable devices
  - TD Series (≥1.0.13)
  - TW Series(≥1.0.9)
  - AP Series (≥1.0.11)
  - RB25S & RB35S (v202400511 or later versions)

Note: Please Reset your stab device (by Lua tools) after flashing the latest firmware on it.

For first-time use after reflashing the firmware with the latest version, please Reset both Stab systems 1 and 2 for the Stab device and do the configurations as your applicating needs. (The original configurations could be invalid after reflashing the firmware, please reset and re-configured the Stab device to make sure it can work properly.)

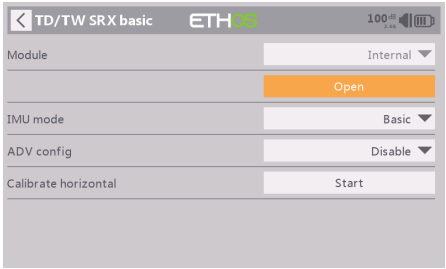




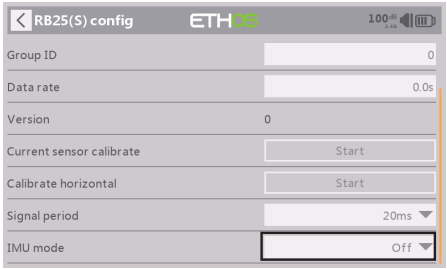
Basic Step Guides

1. IMU Mode Selection.
2. Ensure stabilization is enabled & Calibrate the gyroscope sensor of the device;
3. Servo connection & Build the stabilization device to the model;
4. Set up the mixer channel and radio switches;
5. Determine the [Wing Type] & [Mounting Type];
6. Check the stabilized channel outputs of the receiver in the Auto-Level mode;
7. Check the stick control of the transmitter in the manual mode;
8. Self-Check of the receiver;
9. Flight Mode & Other Configurations.

IMU Mode (ADV Capable Device)- by Lua SRX Basic / RB25(S) | RB35(S) Config Tools

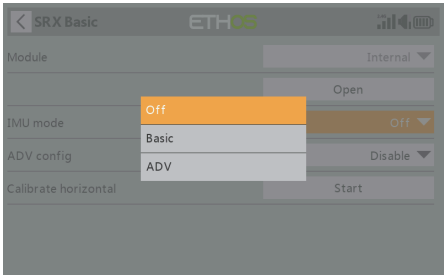


Select the RF module type (Internal/External) which is currently bound to the Stab deivce, then click the [Open] to enable the functions of this Lua tool.(for TW/TD Stab receivers)



The IMU Mode can be directly enabled by the RB Config Tool.(for RB Stab device)

IMU Mode Selection

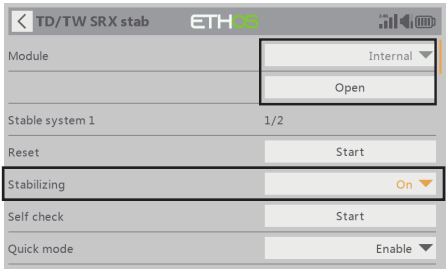


The Stab devices with ADV features offers three modes below to setup the stabilization module.

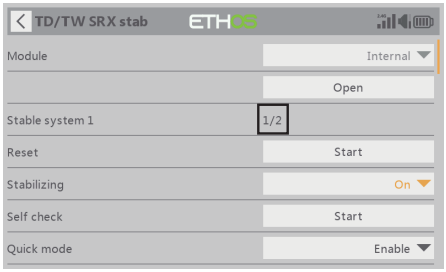
- **OFF mode:** The stabilization module is not activatedin the mode.
- **BASIC mode**: The mode is enabled by default can do the basic configurations directly on radio.
- **ADV mode:** The mode supports full configuration of stabilization mode with RBmixer programmer on PC.

Note: For accessing more flexiablities of ADV stabilizaition feature, please use the RBmixer program to configure the stabilization module.)

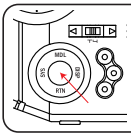
Two independent stabilizing functions - by Lua Stab Tool



Select the RF module type (Internal/External) which is currently bound to the Stab deivce, then click the [Open] to enable the functions of this Lua tool. Ensure the stabilization function is enabled



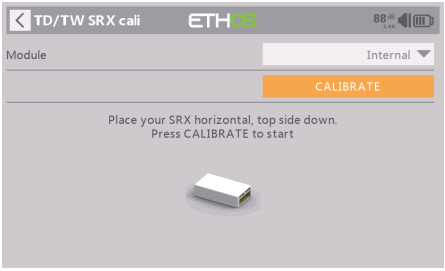
Stable System 1/2 page: Allows turning on/off the 1st bank of stabilization channels (CH1-6);
Stable System 2/2 page: Allows turning on/off the 2nd bank of stabilization channels (CH7-11);



Note: Pressing the center button of the left navigation menu buttons, users can switch to the second configuration page of stabilization channels.

Note: The settings for Stable System 1 and 2 are independent, Stab calibration and self-check should be completed for both stab systems.

Gyroscope Sensor Calibration - by Lua Cali Tool



Select the RF module type (Internal/External) which is currently bound to the Stab deivce, then click the [CALIBRATE] to start the calibration for the Stab device.(for Stab receivers)

The calibration step can be directly initialed by the RB Cali Tool. (for RB Stab device)

Move to [Cali] tool and calibrate the gyroscope sensor

1. 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 instruction steps below to calibrate the gyrosope sensor;
2. Make sure the stabilization device with the Logo label side facing upwards laying on the desktop, move to the radio and enter the [Cali] tool, and select "click to confirm". At this moment, the yellow LED light will flash until it lits off, then follow the prompts to calibrate the sensor;
3. Complete the calibration of all the device surfaces. Ensure the values of each axis (X, Y, Z, Mod) is about 1.000 while placing the device in the corresponding direction, and the deviation could be within ±0.1;
4. The calibration is completed if all the steps above are done.

Servo connection & Build the device to the model

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

Note: Please ensure the nose direction of the Stab device is always forward for the installation.

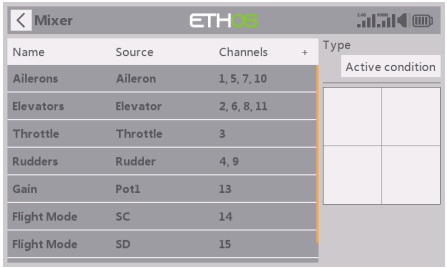
Number of Channel	Corresponding parts on the model	Full name
CH1	AIL 1	Aileron
CH2	ELE 1	Elevator
CH3	THR	Throttle
CH4	RUD	Rudder
CH5	AIL 2	Aileron
CH6	ELE 2	Elevator
CH7	AIL 3	Aileron
CH8	ELE 3	Elevator
CH9	RUD 2	Rudder
CH10	AIL 4	Aileron
CH11	ELE 4	Elevator
CH12	User-defined	
CH13	User-defined	Gyro 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. Until the value is ±100%, the gain reaches maximum.

Attentions
CH1~CH12 should be connected to the corresponding servos.

Mixes Settings - by ETHOS

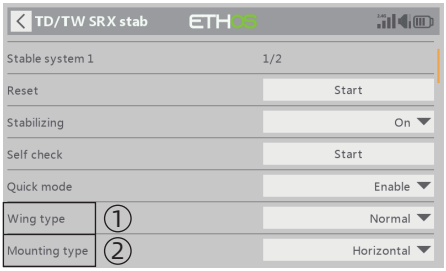
Set up the mixer channel and radio switches



Refer to the Channel List to set the channel and switches. The switch setting of CH13-15 on the picture is for reference.

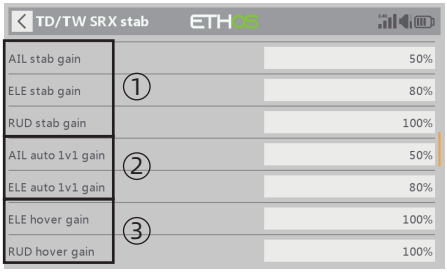
Determine the [Wing Type] [Mounting Type] [Gain & Offset] [Stick Priority] etc. - by Lua Stab Tools

Move to the [SRx stab] tool, determine the [Wing Type] & [Mounting Type]

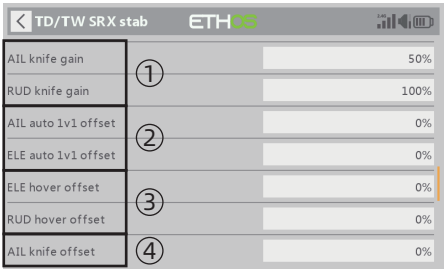


① Wing Type
② Mounting Type

[Gain] and [Offset] configurations of flight modes

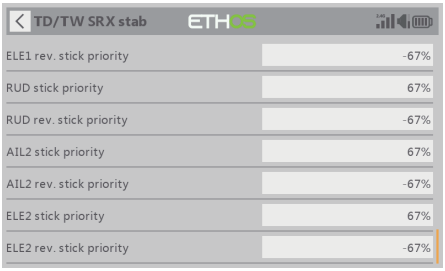


① Gain - Stab Mode
② Gain - Auto-Level Mode
③ Gain - Hover Mode



① Gain - Knife Mode
② Angle Offset - Auto-Level Mode
③ Angle Offset - Hover Mode
④ Angle Offset - Knife Mode

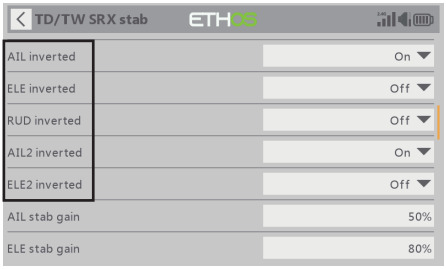
Stick priority & Reversed stcik priority for AIL1/2, RUD and ELE1/2 channels



Note: The stabilized feature will turn invalid when the output values of the stick operations on these channels exceed the set values for the stick priority, or under the conditions in the set range of angle mode.

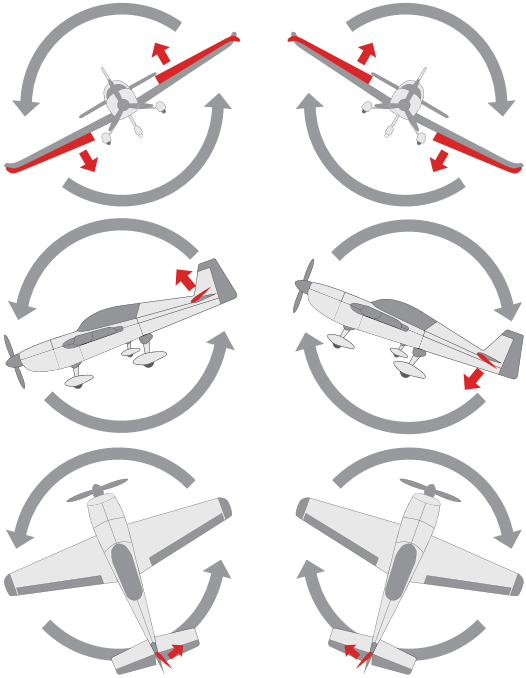
Channel output check in Auto-Level mode - by Lua Stab Tool

Check whether the reaction of the wing servo is in line with the flight attitude caption below in the [Auto-Level] mode. If not, please try to invert the corresponding channel output in the [Stab] tool.



Inspection of flight attitude

To ensure flight safety, checking the compensation direction of the model is strongly recommended. Activating auto level mode will produce a strong deflection on AIL and ELE, which is used to check the response of aileron and elevator. Also, activating Knife-edge and Hover mode will have the same reaction 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.

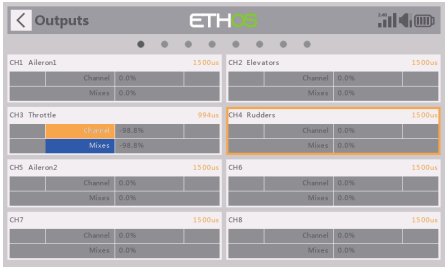
When the plane is rotated to left or right (Yaw), rudders should have the correcting actions as illustrated.

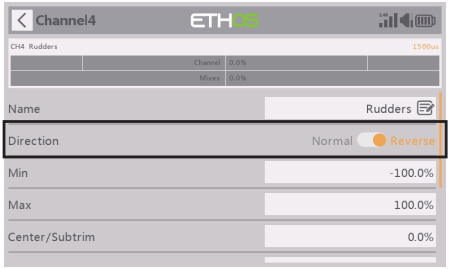
⚠ **After changing the compensation direction, make sure to check it again on the actual model.**

Note:
If the compensation direction is incorrect, please reverse the corresponding channel as illustrated above through the [Stab] tool.

Channel output check in Manual mode - by ETHOS [Outputs] Tool

Check whether the reaction of the wing servo is in line with the radio stick operation in the [Manual] mode(Gyroscope is off). If not, please try to invert the corresponding channel output by pressing the channel bar in the integrated [Output] tool of ETHOS.



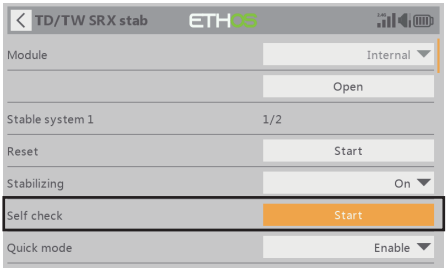


SelfCheck - by Lua Stab Tool

SelfCheck

1. Make sure the model is in a horizontal position on the ground, and keep all the channels (except for the throttle channel) in the center position.
2. Move to [System] and enter the [Stab] tool, then click [Start] and the blue LED light turns on. Once the blue LED starts flashing, we can calibrate the maximum travel of stick channels (excluding the throttle channel).
3. If the calibration is completed, the LED turns off and the servos react left and right to indicate that the calibration process is completed.

Do the Self-Check in the [Stab] tool.

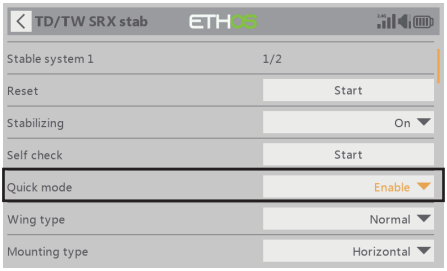


[System] → [Stab] → [Self-Check]

Note: To do the Self-Check of the stabilization device, please ensure the stabilization function is enabled. Enter the [Stab] tool and turn On the [Stabilizing], then quit the [Stab] tool and back into this tool again, now the [Self-Check] function is capable to enable.

Flight Mode & Other Configurations - by Lua Stab Tool

Quick Mode



Enable the Quick Mode in the [Stab] tool.

It supports stabilization mode, auto-level mode, and manual (Gyroscope is off) mode and configured through CH14. The precise configuration is written below.

Note: The default mode is Quick Mode.
- If Quick Mode is applied, there is no Knife Edge or (3D) Hover Mode.
- CH15 is not used when using Quick Mode.

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

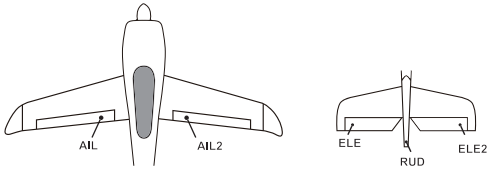
Conventional Mode

It supports stabilization mode and manual (Gyroscope is off) mode and configured through CH14&15. The precise configuration is Written below.

Flight mode	Stabilization	Automatic level	Hover	Knife-Edge	Off
CH14 (3 pos SW) CH15 (3 pos SW)	CH14 SW Down & CH15 SW Mid	CH14 SW Down & CH15 SW Down	CH14 SW Down & CH15 SW Up	CH14 SW Up & CH15 SW Mid	CH14 SW-Mid

Model Configuration Reference

Conventional Model

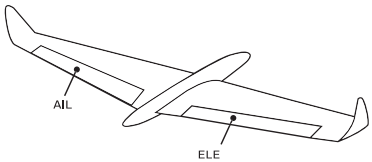


Layout

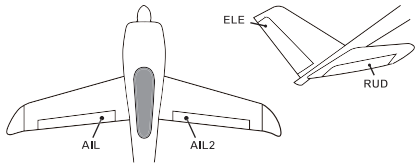
Flight mode	Stabilization	Automatic level	Hover	Knife-Edge	Off
CH14 (3 pos SW)	CH14>M+H (CH14 SW Down)	CH14>M+H (CH14 SW Down)	CH14>M+H (CH14 SW Down)	CH14<M-H (CH14 SW Up)	CH14 SW-Mid
CH15 (3 pos SW)	M-H<CH15<M+H (CH15 SW Mid)	CH15>M+H (CH15 SW Down)	CH15<M-H (CH15 SW Up)	M-H<CH15<M+H (CH15 SW Mid)	

Note: M: represents a neutral signal period (1500μs)
H: represents the time of required signal change to activate the mode (50μs). When the factory settings are selected, the switch position shown above represents the required modes.

Delta wing & Flying wing & V-tail



Layout of Delta wing / Flying wing



Layout of V-tail

The available flight modes can be assigned to CH14 with a three-position switch.

Flight mode	Stabilization	Auto Level	Off
CH14	CH14>M+H (CH14 SW Down)	CH14<M-H (CH14 SW Up)	CH14 SW-Mid

1. When Delta wing/Flying wing is selected, the signal produced by the transmitter should be without active mixes on the channels related to AIL and ELE. The Stab device will mix the AIL (CH1) and ELE (CH2) input signal with a fixed mix percentage automatically.

2. When V-tail type is selected, the signal produced by the transmitter should be without active mixes on the channels related to ELE and RUD. The Stab device will mix the ELE (CH2) and RUD (CH4) input signal with a fixed mix percentage automatically.

Stabilization: When the model is activated, The Stab device will compensate with external forces (wind) as soon as receiving commands from the transmitter. This function is used to enhance the stability of the model on three axis (Pitch, Roll, YAW). CH13 could be used to adjust gyro gain by assigning a knob or a slider, changing the sensitivity of the counteracting signal produced by the internal three-axis gyroscope.

Automatic level: When the mode is activated, The Stab device will make the model return to level orientation with internal three-axis accelerometer and three-axis gyroscope on AIL and ELE channels after the sticks being released to neutral. RUD channel works in stabilization mode only.

Hover: When the mode is activated, The Stab device will make the nose of the model straight up with internal three-axis accelerometer and three-axis gyroscope on RUD and ELE channels (ELE and RUD inputs are not required). Under this mode, AIL is used to control the rotation of the model and THR adjust the altitude. AIL channel works in stabilization mode only.

Knife-egde mode: When the mode is activated, The Stab device will roll the plane on a certain side (wing points up) with internal three-axis accelerometer and three-axis gyroscope on RUD and AIL channels.Thus, AIL inputs are not required. While the mode steering is done with ELE, altitude will be maintained with THR/RUD. ELE channel operates in stabilization mode only.

Off: When the mode is activated, The Stab device will transmit the received commands produced by the transmitter to the model without compensating.

Configuration for the Movement Range of the Roll and Pitch Angle - by LUA Stab Tool

⚠ **Make sure the [Stab] script tool has been downloaded and placed in the [Scripts] folder of the storage card. The tool can be found under the [System] menu page after rebooting the ETHOS system.**

Ensure the receiver is bound to the radio and its Stab data is readable through Lua script. The movement angle of Roll and Pitch for Stab 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.**