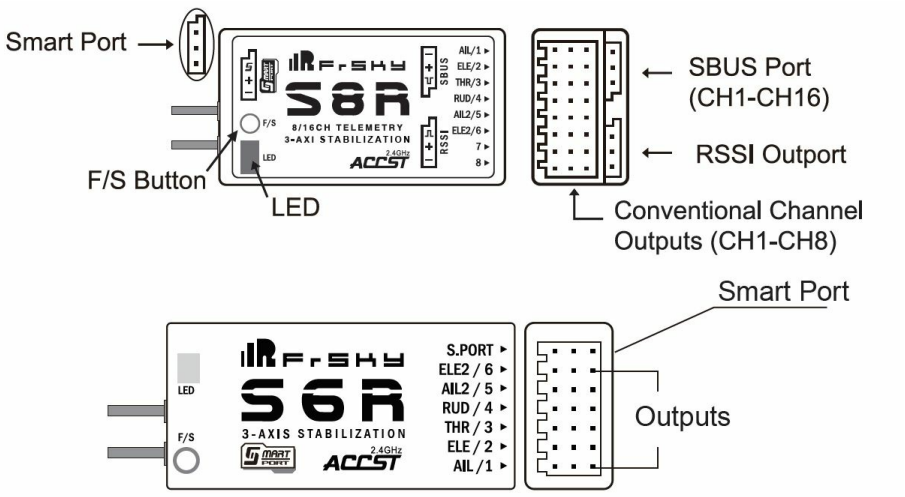
FrSky 01140055 S6R-S8R PWM Receiver Stabilisation and Smart Port Instruction Manual

Contents

FrSky 01140055 S6R-S8R PWM Receiver Stabilisation and Smart Port

Overview



Working State

Green LED	Red LED	Status
ON	Flashing	Binding
Flashing	OFF	Normal
OFF	Flashing	Signal lost

Yellow LED	Status
ON	Accelerometer outside of Calibration limits[0.9 G , 1.1 G]
OFF	Accelerometer within Calibration limits [0.9 G , 1.1 G]
Flashing	Completed accelerometer calibration

Blue LED	Status
ON	Self-check in progress
OFF	Completed self-check

Specifications

- Model name: S6R (6CH receiver with built-in 3-axis gyro and 3-axis acceleration)
- 47.42×23.84×14.7mmmm (L × W × H)
- S8R (8CH/16CH receiver with built-in 3-axis gyro and 3-axis acceleration)
- 46.47×26.78×14.12mmmm (L × W × H)
- Weight: S6R 12.1g ; S8R 14g
- Number of Channels: S6R 6CH (1~6CH from conventional channel outputs)
- S8R 16CH (1~8ch from conventional channel outputs, 1~16ch from SBUS port)
- Operating Current: S6R 100mA@5V ; S8R 120mA@5V
- With RSSI PWM output on board (S8R only) PWM voltage output(0~3.3V) 100HZ 1500±500us

- Operating Voltage Range: 4.0~10V
- Operating Range: full range
- Gyroscope Measurement Range: ±2000dps
- Accelerometer Measurement Range: ±4g
- Firmware Upgradeable
- Compatibility: ACCST D16

Features

- Built-in three-axis gyroscope and three-axis accelerometer sensor module
- Built-in RSSI PWM output (0~3.3V) (S8R only)
- Built-in battery voltage detection.
- Smart Port enabled

Channels

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

Number of channel	Corresponding parts on the model	Full name
CH7	User-defined	
CH8	User-defined	
CH9	No mark	Gyro gain adjustment
CH10&CH11	No mark	Flight modes
CH12		Self-check activation switch

Gyro gain adjustment of CH9: When the the value of CH9 is in the center, the gain is zero. The gain increases as the value gets bigger. Until the value is ±100%, the gain reaches the maximum.
Note: CH9~CH12 are not marked on the diagram. CH9 Edit — Setting CH9 at Weight 50 and offsetting 50, the assigned pot/slider will work normally.

Attention
CH1~CH8 should be connected to the corresponding servos. S.Port could be used to update, and edit parameter settings via the FrSky STK PC tool and connect with telemetry sensors.

Binding Procedure

- Binding is the process of uniquely associating a particular receiver to a transmitter/transmitter module. A transmitter/transmitter module can be bound to multiple receivers (not to be used simultaneously). A receiver can only be bound to one transmitter/transmitter module. Follow the steps below to finish the binding procedure.
- Put the transmitter/transmitter module into binding mode
- For Taranis X9D Plus 2019 as an example, turn on the radio, go to the MENU – MODEL SETUP – PAGE 2, choose Internal or External RF, choose the [mode] ACCST D16, and select BIND.
- For Horus X10 Express as an example, turn on the radio, go to the MDL – INT MODULE or EXT MODULE, choose the [TX RF Protocol] ACCST D16, and select BIND.
- For the transmitter module (XJT as an example), turn on the transmitter while holding the FS button on the module, release the button, and the RED LED on the XJT module flash.
- Connect the battery to the receiver while holding the F/S button on the receiver. The RED LED on the receiver will flash, indicating the binding process is completed.
- Turn off both the transmitter and the receiver.
- Turn on the transmitter and connect the battery. The GREEN LED on the receiver indicates the receiver is receiving commands from the transmitter.
- The receiver/transmitter module binding will not have to be repeated unless one of the two is replaced

Note: After the binding procedure is completed, recycle the power and check if the receiver is really under control by the linked transmitter.

Set up your model and receiver step by step
You need complete calibration of the Accelerometer about the six positions via the S6R/S8R.Lua/FreeLink APP/FreeLink.exe first.

- Step 1: Connect your servos following the channel list according to your model.
- Step 2: Set your radio following the channel list.
- Step 3: Choose the Wing Type via the configuration tool (S6R/S8R.Lua/FreeLink APP/FreeLink.exe).
- Step 4: Choose the AUTO LEVEL mode, and check the model servo feedback.
- Step 5: Choose the manual mode, and check servo feedback via the transmitter.

Quick Mode
It supports stabilization mode and manual (six-axis off) mode and is configured through CH10. What's more, an urgent mode is added to configure automatic level mode default through CH12. The precise configuration is written below.

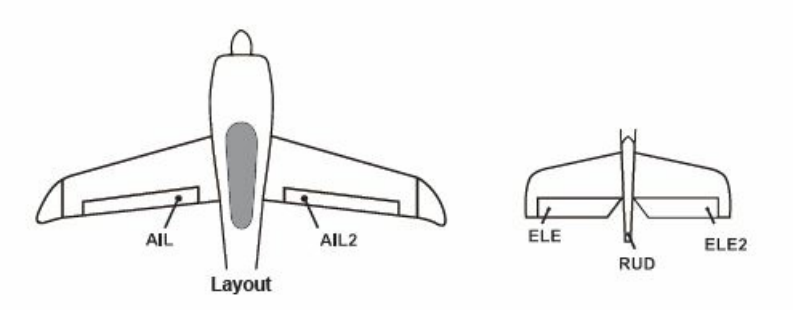
Channel	Position	Flight Mode
CH10	SW Down	None
	SW Mid	Stabilization Mode
	SW Up	Automatical Level Mode
CH12	SW Down	Urgent Mode (Automatic Level Mode)

Note: The default mode of S6R/S8R is Quick Mode. When re-flashing the firmware of S6R/S8R or replacing it with a new one, the preset mode will be cleared out.

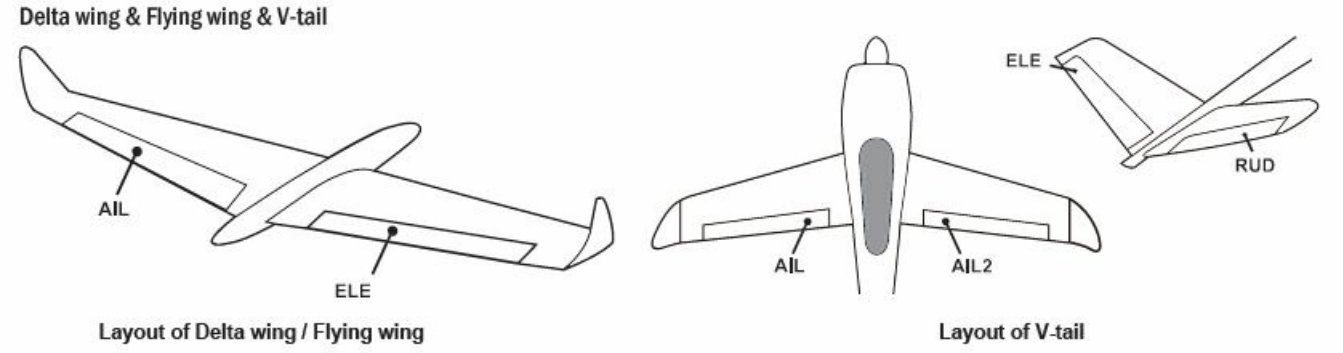
- If Quick mode is applied, there is no Knife Edge or (3D) Hover mode.
- CH11 is not used when using Quick Mode.

Modes
The model types could be enabled via Freelink.exe or S6R/S8R.Lua. If required, S6R/S8R could be used as a standard 6/8 channel receiver.

Conventional model
The available flight modes can be assigned to CH10 and CH11 with three-position switches.



Delta wing & Flying wing & V-tail
The available flight modes can be assigned to CH10 with a three-position switch



When the Delta wing/Flying wing/V-tail is selected, the signal produced by the transmitter should be without active mixes on the channels related to AIL and ELE. S6R/S8R will mix the AIL(CH1) and ELE(CH2) input signal with a fixed mix percentage automatically. Signals on CH4~CH8 will behave as required by the user.

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.

Flight mode: Off
When the mode is activated, S6R/S8R will transmit the received commands produced by the transmitter to the model without compensating.

Stabilization: When the model is activated, S6R/S8R will compensate for external forces (wind) as soon as receiving commands from the transmitter. This function is used to enhance the stability of the model on three axes (Pitch, Roll, Roll). CH9 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, S6R/S8R will make the model return to level orientation with an internal three-axis accelerometer and three-axis gyroscope on AIL and ELE channels after the sticks are released to neutral. RUD channel works in stabilization mode only.

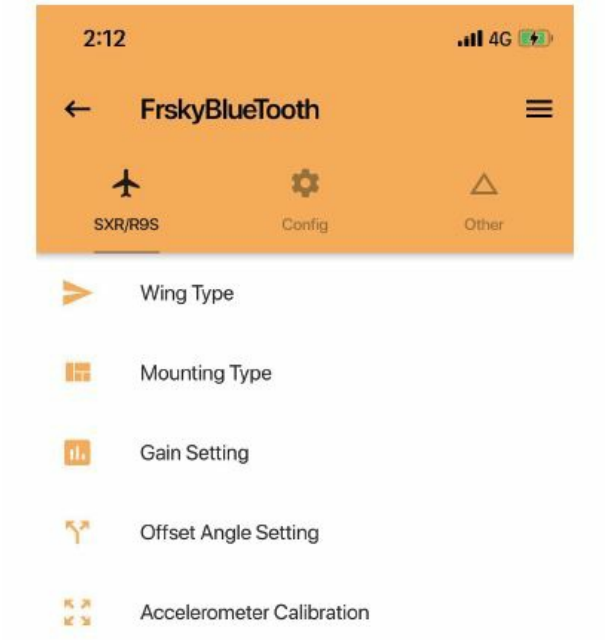
Hover: When the mode is activated, S6R/S8R will make the nose of the model straight up with an internal three-axis accelerometer and three-axis gyroscope on RUD and ELE channels (ELE and RUD inputs are not required). Under this mode, AIL is used to control the rotation of the model and THR adjusts the altitude. AIL channel works in stabilization mode only.

Knife-edge mode: When the mode is activated, S6R/S8R will roll the plane on a certain side (wing points up) with an 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.

Configuration

Methods: APP configuration
FrSky radio configuration

PC configuration software (FrSky STK USB updater)
Configuration parameters: Wing type, mounting type, gain setting, offset angle setting, accelerometer calibration. APP(IOS/Android) configuration Connect the S6R/S8R to the App with AirLink S. The menu screen on the home page is displayed below:



IOS FreeLink APP
FrSky radio configuration:

- Copy the S6R/S8R.Lua files on the SD card of the transmitter
- Bind the S6R/S8R to the transmitter and run the files.

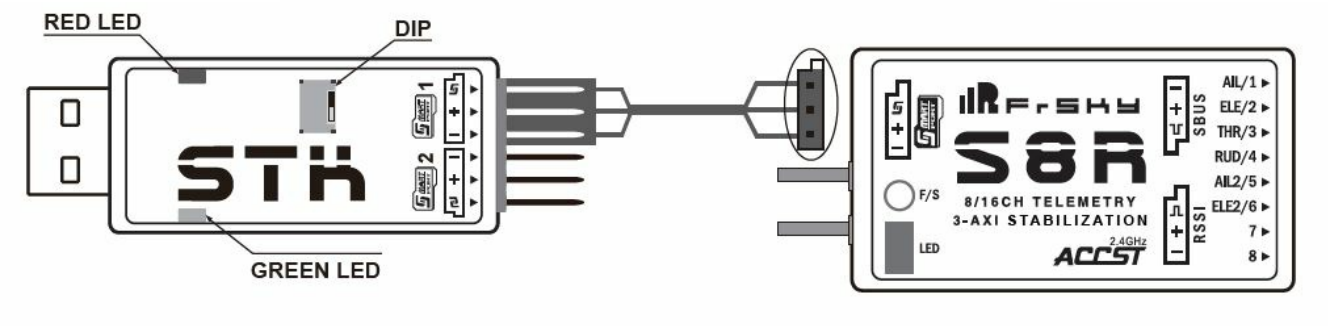
PC configuration software

- Connect S6R/S8R as shown below to the FrSky STK USB adapter, and plug it into PC
- Run the S6R/S8R Freelink.exe and access the home page.

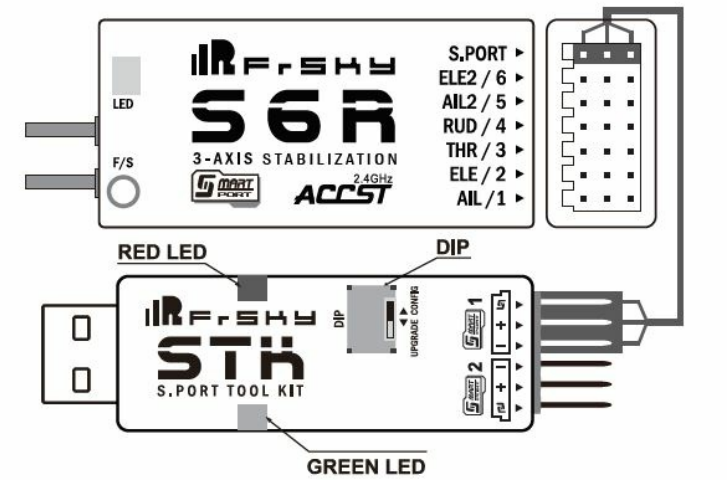
- Press open to connect with S6R/S8R.

IOS FreeLink APP

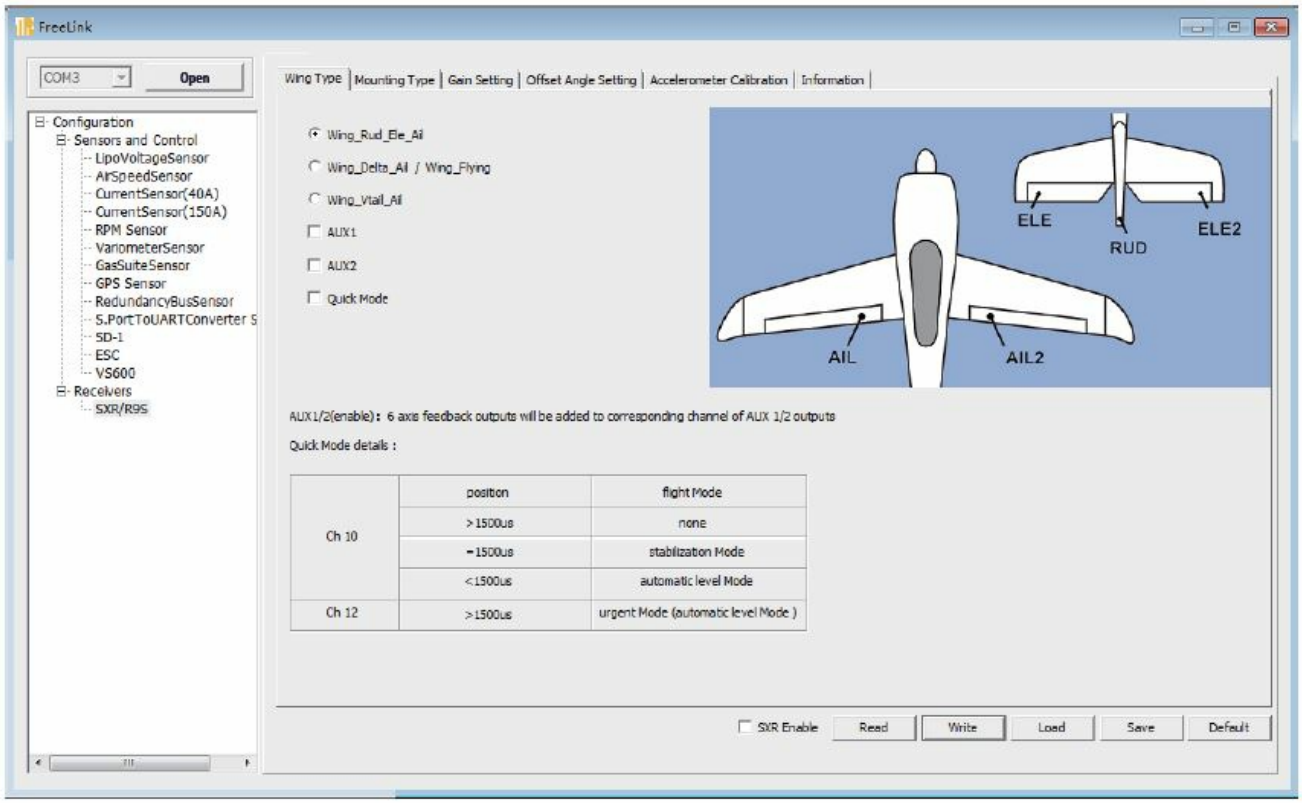
Android FreeLink APP



The menu screen on the home page is displayed below



1. Open: Gives the PC software access to S6R/S8R configuration data.

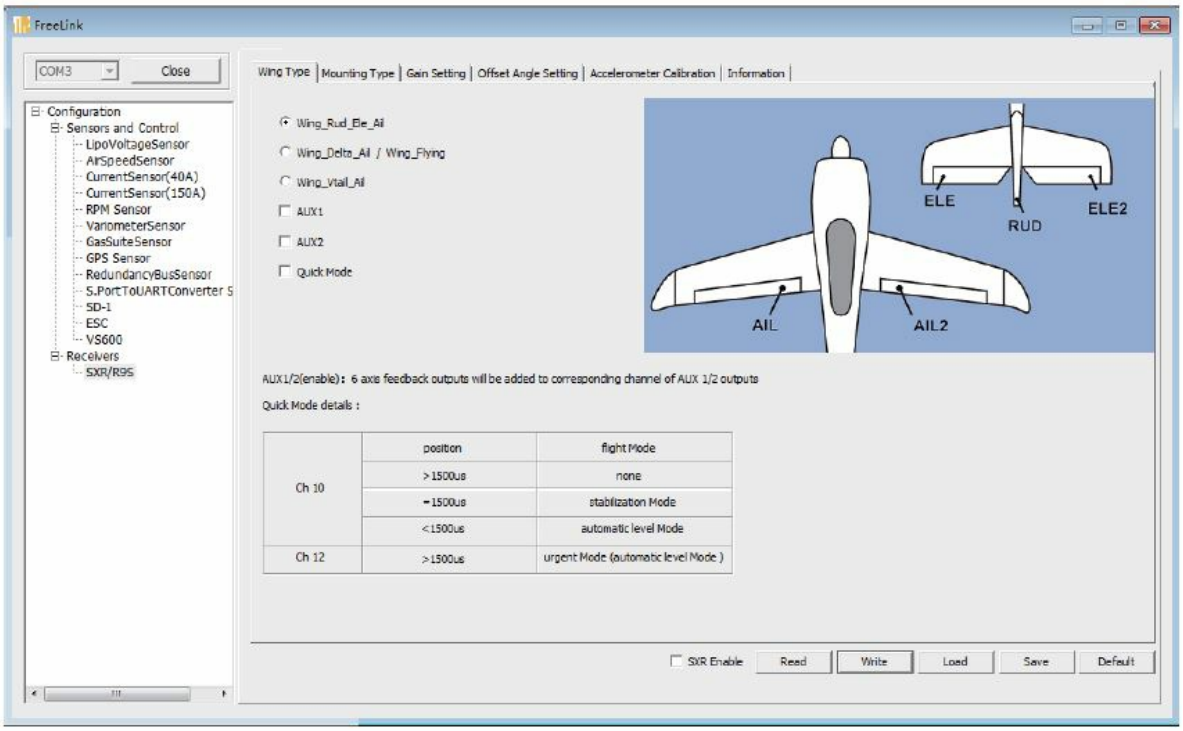


2. Read Retrieves the stored S6R/S8R data to be edited in the PC software.
3. Write: Stores the setted data on S6R/S8R.
4. Load: restore the settings into the file you saved before.
5. Save: save all settings to one file.
6. Default: Returns all PC software settings to the factory defaults.
7. SXR Enable: Enable/Disable the stabilization function

Configuration parameters

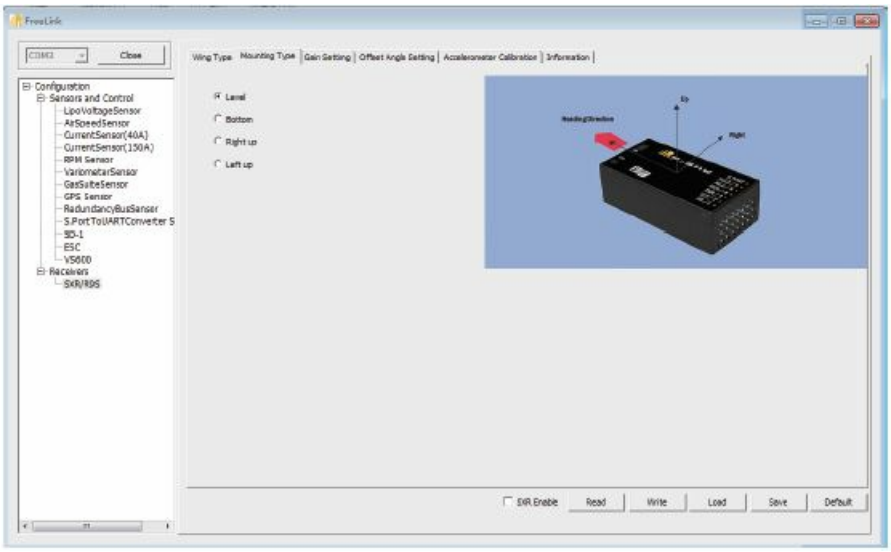
The configuration parameters are listed on the top of the interface: Wing type, Mounting Type, Gain Setting, Offset Angle Setting, Accelerometer Calibration

- Options of wing types: Wing_Rud_Ele_Ail——conventional model



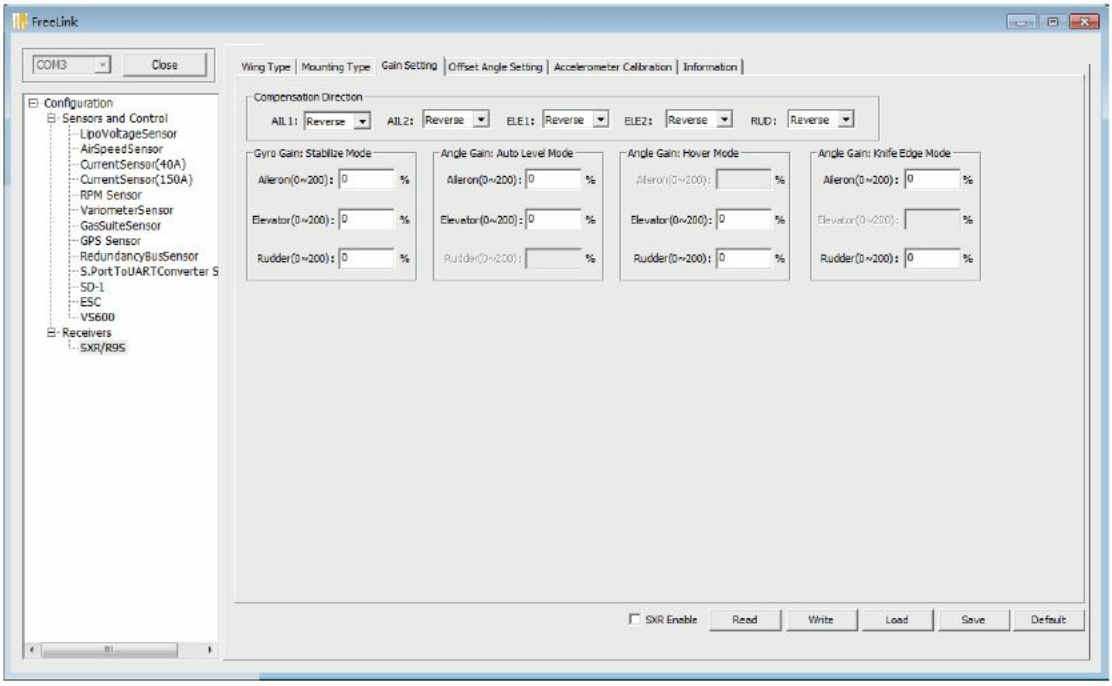
- Wing_Delta_Ail/Wing_Flying—— Delta/Flying wing
- Wing_Vtail_Ail——V-Tail
- AUX1: If selected, AIL2 function will be disabled on CH5
- AUX2: If selected, ELE2 function will be disabled on CH6

Mounting type
Level, Bottom, Right and Left up options are available. Gain Setting

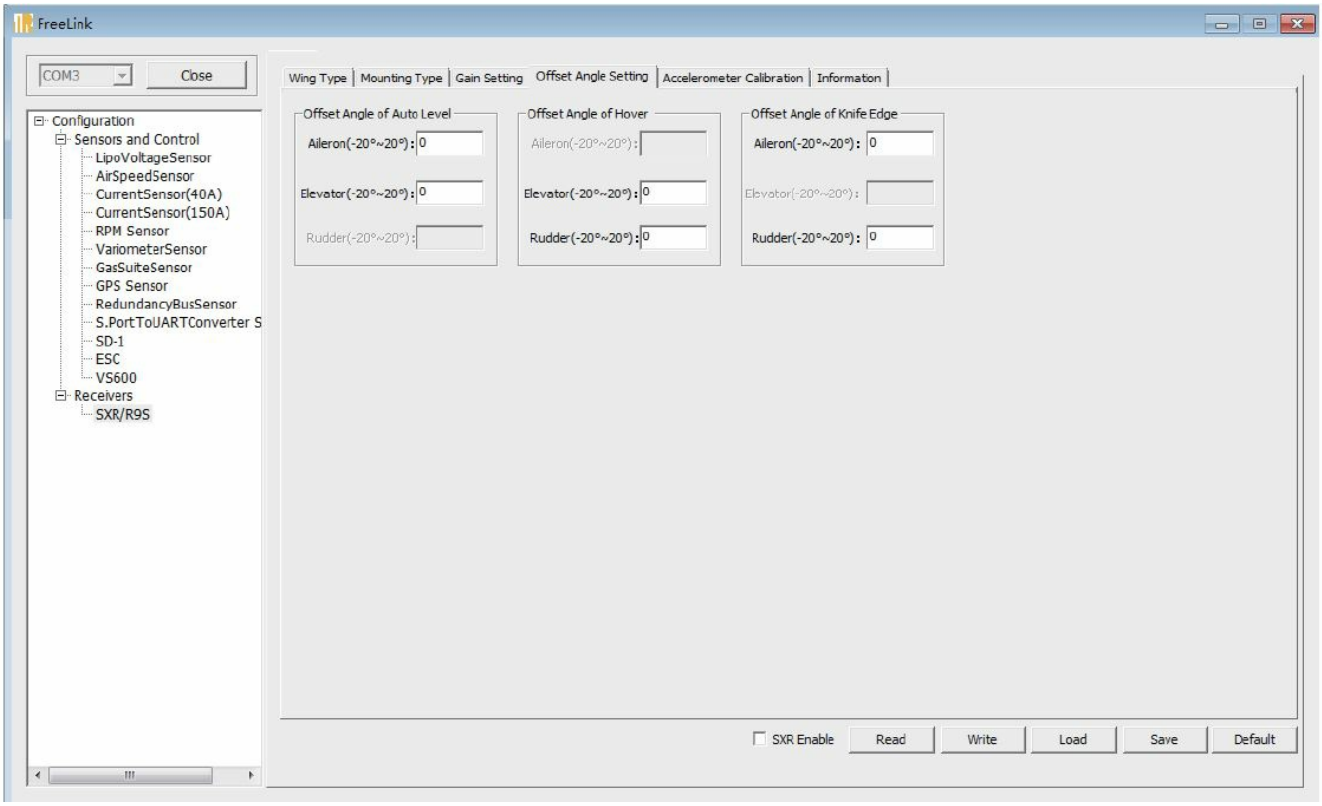


The first part
Compensation direction: Select the travel direction of AIL, AIL2, ELE, ELE2 and RUD. “ ” means positive and “ ” means negative. The second part

Gyro gain: Stabilization Mode
The gain setting under stabilization mode chould be set on the channels related to aileron, elevator and rudder.



Angle Gain: Auto Level Mode
The gain setting under automatic level mode could be set on the channels related to aileron and elevator.



Angle Gain: Hover Mode
The gain setting under hover mode could be set on the channels related to elevator and rudder.

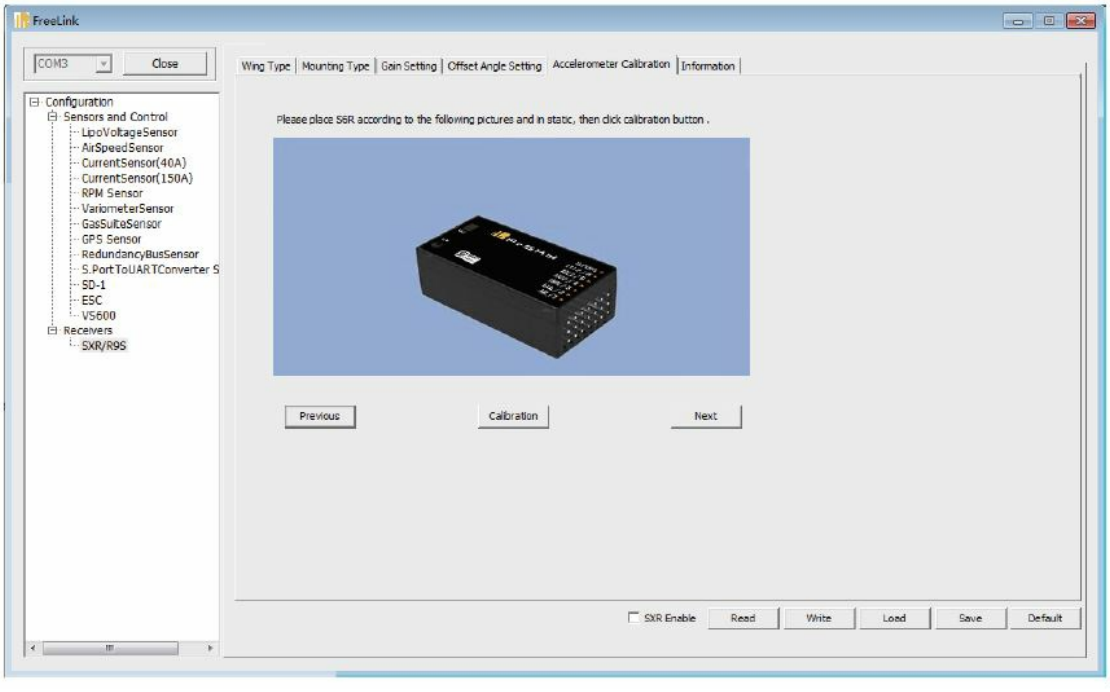
Angle Gain: Knife Edge Mode
The gain setting under knife-edge mode could be set on the channels related to aileron and rudder.
Note: Optional range is from 0 to 200%. 0, 1, 2 refers to 0%, 100% and 200% respectively.

Offset Angle Setting
Due to the possible errors in minor installation and calibration, the function is designed to adjust the attitude of the model. Thus, the user could achieve the best orientation when Auto Level, Hover mode and Knife-edge mode is activated.

Offset Angle of Auto Level

- The angle of roll and pitch could be adjusted on the channels related to aileron and elevator. Straight and Level flight could be realized. Offset Angle of Hover
- The nose-up angle could be adjusted on the channels related to aileron and elevator. Stationary hover could be realized in calm weather. Offset Angle of Knife Edge
- The angle of the aileron and rudder could be adjusted on the related channels. Straight and level knif-edge flight could be realized.Note: Optional range is from -20° to 20°.

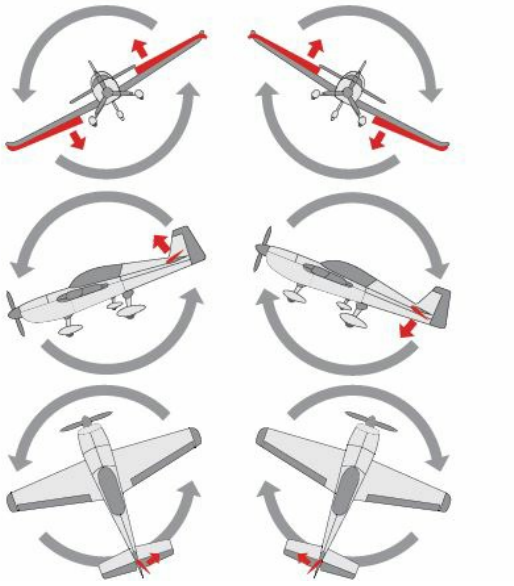
Accelerometer Calibration



The positive and negative values related to the three-axis gyroscope and accelerometer make a total of six values that need to be acquired. Please follow the on-screen instructions.

- Click the “Calibration” button and wait until the YELLOW LED flashing, indicating the calibration on this orientation has been completed.
- Repeat the above step five times (remaining 5 dimensions). Placing S6R/S8R in the required orientation, ensure all values (X, Y, Z, Mod) are displaying 1.000 with a deviation of ±0.1.
- Press “Write” to save the data on S6R/S8R when done.

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.



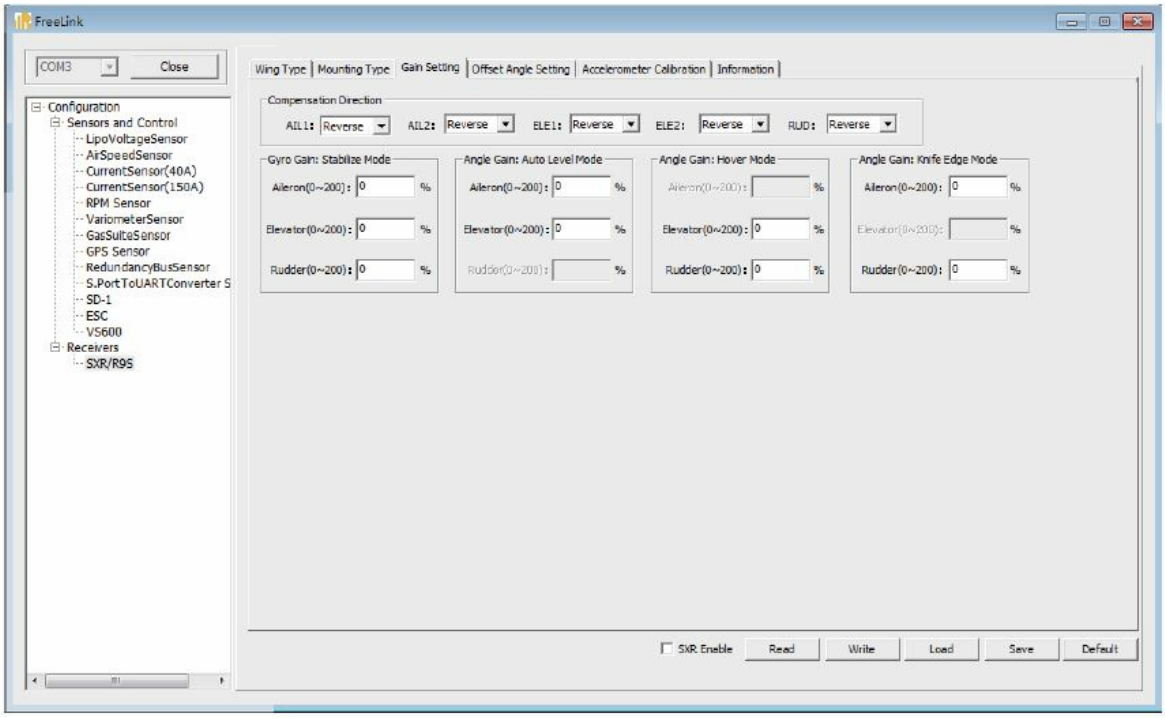
- When the plane is rotated left or right (Roll), ailerons should have the correcting actions as illustrated above.
- When the plane is rotated up or down (Pitch), elevators should have the correcting actions as illustrated above.

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

Self-check

- Before self-check, please place the model on the groud (level surface).
- When the model is flying, aerodynamic balance is more important than level attitude, which results in the model flys at a constant altitude with the nose slightly pointing up at low speed.
- To avoid the nose-diving of the model at high airspeed, the user must insure that the model is placed at a level or slightly-nose-up attitude during self-check.
- Always install S6R/S8R straight and level in the model. If required, PC software could be used to adjust the angle of attack with the purpose of realizing the required setting.
- If the values set by the user is bigger than average ones, we advise to recheck the installation orientation of S6R/S8R.

Steps



- Turn on the transmitter and ensure that Ail (CH1), ELE (CH2), RUD (CH4), AIL 2(CH5) and ELE (CH6) are in the neutral position.
- Power on the model and start S6R/S8R self-check. Ensure the auto level angle of the gyro and the neutral position of gimbal. Please don’t
- Press the button on S6R/S8R or move the three-position sticks bound to CH12 three times in 3 seconds (up, mid, down). Then the BLUE LED will turn on, indicating self-check procedure is initiated.
- After that, the corresponding partson the model will move. At last, the BLUE LED will turn off, indicating self-check has been completed.
- Move the sticks bound to CH1~CH6 (except the stick related to Thr) and check the channel output limits, ensuring that the signal outputs of S6R/S8R will not damage the corresponding parts on the model.

- In the end, S6R/S8R will save the zero points of the gyro, auto level angle, gimbal neutral position and servo channel limits.
- Never operate the stick bound to CH12 during flight session. If so, it will trigger self-check and may cause the crash of the model.
- Cut off the power supply of S6R/S8R, or self-check will fail.

Setup

- Calibrate S6R/S8R with the PC software and install it into the model. Insure the settings of wing type and mounting type are identical to the intended model installation.
- Turn on the transmitter and reduce the value of servo endpoint setting. Ensure self-check mode will not damage the corresponding parts on the model.
- Assign a knob/slider to CH9, then real-time gain adjustment capabilities of S6R/S8R will be activated.
- Assign three-position switches to CH10 and CH11 with the purpose of switching available flight modes.
- Power on the model and check the deflection direction of each related parts on the model. Make sure the switch assigned to flight modes is correct and the compensation direction of the gyro is set as intended on AIL, RUD and ELE.
- Make a self-check for S6R/S8R if necessary. Disconnecting the power on S6R/S8R will not lose the set parameters.
- Under identical operating conditions, the value of each channel produced by the assigned switch in FrOS are opposite to that in OpenTX. For exmaple, SW Up in FrOS is equal to SW Down in OpenTX.

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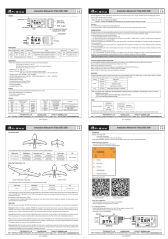
Documents / Resources

	**FrSky 01140055 S6R-S8R PWM Receiver Stabilisation and Smart Port** [pdf] Instruction Manual 01140055 S6R-S8R PWM Receiver Stabilisation and Smart Port, 01140055, S6R-S8R PWM Receiver Stabilisation and Smart Port, PWM Receiver Stabilisation and Smart Port, Stabilisation and Smart Port, Smart Port, Port

References

- MH **Search - Manual-Hub.com**