SN-L v2 司南飞控

FixedWingFLightController + Pixel OSD

Verv2.2
FW 3.2+

LeFeiRC

2020/4/20

WARING：

Please strictly observe the relevant national laws and regulations for safe flight. We do not advocate flying high, flying far, experience the fun of the model airplane in a fully safe environment, and create a good environment for model airplane sports! Before using the flight control, you must fully understand the various safety details and deeply understand that the flight is risky. It is impossible to be completely reliable on the equipment and any electronic products on the aircraft. You should use the Sinan (SN_L) fixed-wing flight control to evaluate the product and use the system according to relevant regulations. The system provider does not use the product for any use. Responsible for direct or indirect losses and consequences.

i. 目录

1. INTERFACE：

➢ **POWER**

① VTX, CAM, are powered by PMU 12V

② GPS, FC are powered by PMU 5V

③ Servo and receiver are powered by external BEC

➢ **LED**

GREEN LED	GPS
OFF	disconnect
FLASH	Satellite < 7
ON	Satellite > 6

RED LED	RC
FLASH	Lose control
ON	normal

➢ **CONNECTOR**

AIL	AIL servo (output)
ELE	ELE servo (output)
THR	ESC signal (output)
RUD	RUD servo (output)
AUX1 /PPM	PPM connector/AUX1(output)
AUX2	AUX2(output)
AUX3/AirSpeed	Airspeed connector (input)/AUX3 (output)
RC	SBUS (input)
RSSI	

2. FLIGHT MODES:

MANUAL	Remote control directly controls the aircraft
STAB	Auto level
HORIZON	ACRO mode + STAB mode(aircraft attitude will follow stick commands with stabilization)
RTH	Return to home position
HOVER	Altitude hold and circle in loiter。
ALTHOLD	Aircraft hold altitude and flight route (with GPS)
HEAD LOCK	Keep on the route
ACRO	Gyro mode (aircraft attitude will follow stick commands)
SUB-MODE	Switch mode to slave mode

➢ **RTH MODE**

① You need to set *< CRUISING SPEED >*, *< CIRCLE RADIUS >*, *< RTH SAFE ALTITUDE >* and *< RTH CIRCLE ALTITUDE >* in the RTH mode.

< RTH SAFE ALTITUDE > refers to the height that the aircraft needs to maintain when returning home; for example: The aircraft begins to return home at an altitude of 2000 meters. At this time, when the *< RTH SAFE ALTITUDE >* is set to 500m, the aircraft will slowly descend to 500 meters and then return home ; If the *< RTH SAFE ALTITUDE >*is less than 500 meters, the aircraft will climb to a height of 500 meters first.

< RTH CIRCLE ALTITUDE > refers to the altitude when the plane is hovering

when *< RTH SAFE ALTITUDE >* less than *< RTH CIRCLE ALTITUDE >* ; plane will hold rth alt.
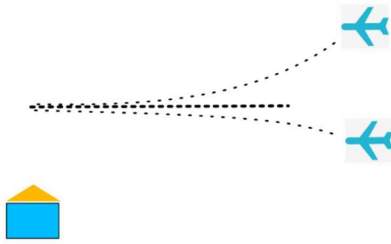
> **ALTHOLD MODE**

FC will lock the route if GPS is connected. Otherwise only hold altitude. The throttle stick is placed in the middle position, meaning that the current speed is equal to the set speed. Move up or down to increase or decrease speed.

> **GEO FENCE:**

Enter the OSD setting item *< AUTO PARAMETER>*:

< GEOFENCE DISTANCE>: The aircraft will automatically switch to the RTH mode when flying over this distance. Cancel the RTH mode by quickly dialing the mode stick; '0' setting is used to remove the radius fence limit.

< GEOFENCE ALTITUDE>: If the aircraft exceeds this altitude, the altitude will be forcibly lowered; '0' setting is used to remove the altitude limit.

3. SWITCH FLGHT MODE:

> **How to Set flight mode**

* It is recommended to lower the remote control's travel range to about 1000-2000, so as to ensure that the flight controller recognizes the effective range.

*Make sure that the six modes are not repeated, such as setting two RTH modes.

① **NO SUB-MODE**

The flight controller will evenly divide channel 5 into 6 segments. If you are using a 3-position switch, the mode may become the first, third and sixth of the 6 modes; if you use Is a 6-segment switch, then you will be able to switch to every mode.

if the mode sw happens to be in an invalid area, the flight controller will switch to the RTH mode. You need to ensure that the minimum value of the channel is around 1000 and the maximum value is around 2000.
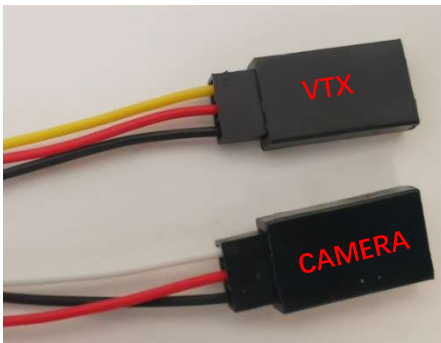
② **width SUB-MODE**

Example:

Position	Mode switch(CH5)	SUB-Mode Switch(CH6)
1	STAB	RTH
2	SUB-MODE	HOVER
3	ALTHOLD	MANUAL

4. INSTALLATION：

➢ **PMU MODULE**

➢ **INSTALL DIRECTION OF FC**

4 install direction：*<BASE FUNCTION> -> <AP DIRECTION>*

| 0°	Arrow point to head
180°	Arrow point to rear
90°	Arrow point to Left side of the nose
270°	Arrow point to right side of the nose

⚠ The FC installation should be placed to try to avoid any vibration sources and keep some distance away from the motor; try to install it near the center of gravity. Be sure to recalibrate the level after changing the installation direction.

➢ **HOW TO CONNECT SERVO**

Interface / Type	AIL	ELE	THR	RUD
Wing	SERVO 1	SERVO 2	THR	
T tail	AIL SERVO	ELE SERVO	THR	RUD SERVO
V tail	AIL SERVO	ELE SERVO1	THR	ELE SERVO2

How to configure the throttle differential: Just configure one of the spare AUX ports such as AUX1 as the *< THR>* function, the flight control will then differentially control the throttle channel and the AUX1 channel; Note that the differential control map is the direction stick, please Confirm that the direction of the throttle differential is correct, and set the differential amount in *< SERVO >-> < THRROTLE DIFF >*. The greater the differential amount, the faster the flight turns, but it is easier to stall. Start with a small value and test fly before increasing.

➢ **CORRECT CONTROL SURFACES MOVEMENT**
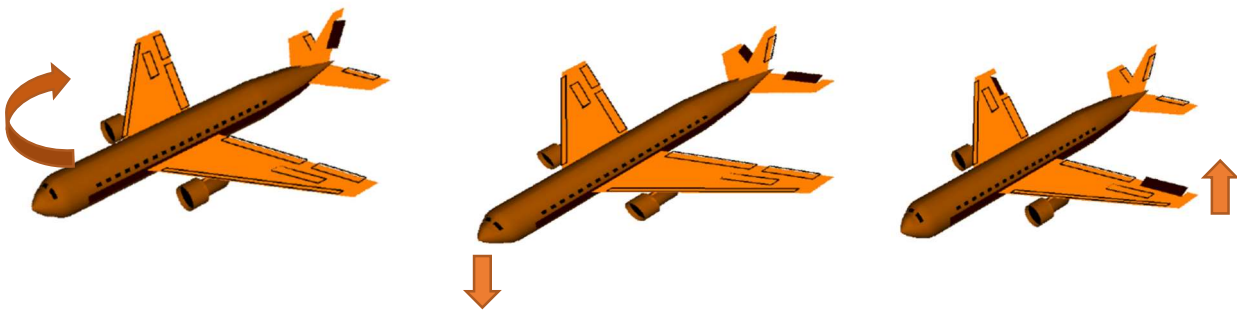
5. REMOTE CONTROLLER

➢ **Set RC channel travel range**

Please set range at OSD or SN_GCS:

Enter OSD menu **<REMOTE>**:

CHANNEL MAX: select and push the throttle stick to max position; hold and exit.

CHANNEL MID: select and exit.

CHANNEL MIN: select and pull the throttle stick to the min position; hold and exit.

➢ **Learn the RC**

Q. Why should learn RC?

A. To let FC learn channel directions and channel type (AETR or TAER).

STEP1: power on FC.

STEP2: pull RUD channel to it's max position (right or left) where the OSD will display a picture show.

STEP3:

➢ **FAILE SAFE**

① An S-BUS receiver can automatically identify an out of control situation and be set up in the radio to auto switch to RTH mode (must only be used when the GPS satellite count is > 6).

② An PPM receiver can't auto identify an out of control situation, so you should set this failsafe mode by yourself.

⚠ **Check the fail-safe mode is functional before every takeoff**

6 . OSD:

➢ **Flight Summary**

After landing, the flight summary will be displayed automatically.

Quick switch the flight mode to cancel the summary window.

➢ **How to enter OSD menu**

Quick switch CH5. You cannot enter the osd menu during flight.

➢ **How to navigate the menu**

To enter the OSD menu item	AIL channel right
To exit OSD menu	AIL channel left
To move the cursor	ELE channel up or down

7 . PRE FLIGHT CHECKLIST:

➢ **Unlock throttle**

① Make sure you have set *< MIN CHANNEL VALUE>*

② GPS Satellites fixed >6

➢ **CHECK ACCEL HEALTH** *<OSD>-<SCOPE>-<HEALTH>*

① The vibration is in good condition. When the plane is flying flat, the vibration point is scattered within the two warning lines.

② The vibration is large, and most of the vibration points fall outside the warning line, this easily leads to the FC to not be able to calculate the correct attitude

➢ **CALIBRATE LEVEL** *<SENSOR>-<CALI LEVEL>*

① Ensure that the aircraft is wings level with slight nose up (cruise level) attitude and remains static during horizontal

calibration.

② Horizontal calibration is required after changing the mounting direction..

③ If you have not calibrated for a long time or the temperature difference has changed too much, you need to recalibrate.

➢ **SENSITIVITY ADJUSTMENT**

① *<BASE FUNCTION>-<AIL BASE GAIN> -<ELE BASE GAIN> -<RUD BASE GAIN>*: The larger the value, the faster the reaction speed and this can cause excessive jitter.

② *< BASE FUNCTION >-<FEED FORWARD GAIN>*: The larger the value, the faster the response of the joystick will be, and in this situation with too high a setting the jitter can be easily exceeded.

③ Adjustment Steps:

Step1: set *<FEED FORWARD GAIN>*, normally reduce feed forward gain to 45

Step2: set the *<AIL BASE GAIN> -<ELE BASE GAIN> -<RUD BASE GAIN>*. You can fly by default, then increase or decrease the sensitivity according to the state of flight.

④ PID speed Factor

PRINCIPLE: the faster the speed, the smaller the rudder surface sensitivity should be. The greater the value, the greater the speed involved in PID control.

EXAMPLE: when speed of the aircraft is very fast, the aircraft begins to shake; then you can increase *<ADVACE FUNC>-<STAB GAIN>-<SPEED PID FACTOR>*value.

⑤ **Altitude hold gain** *<ADVANCE FUNC>-<STAB GAIN>-<ALT HOLD GAIN>*

IN RTH，ALT-HOLD, WAY-POINT mode, if aircraft action like this in the pitch direction:

please decrease the alt-hold gain in steps until smooth level flight is maintained.

8. FLIGHT & CONTROL

➢ **AUTO TAKEOFF：**

① AltHold mode：Push the throttle to enough power for launch and the aircraft will automatically climb to a height of 20m.

② RTH mode:

Method 1: push throttle channel up from the zero position, give the plane a forward speed until the motor starts.

Method 2: push throttle channel up from the zero position, shake the aircraft, until the motor starts. The aircraft will auto climb to 30m.

➢ **SPEED CONTROL**
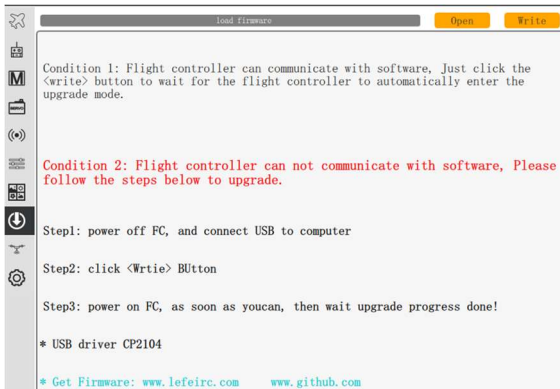
① Disconnect Airspeed

Speed is controlled by the ground speed, cruising speed set in *<ADVANCE FUNCTION>-<CURISE SPEED>*.

② Connect Airspeed

Speed is determined by airspeed, Preventing the wind from flying in the head, causing the ground speed to be too small, please set *<MINIMUM GROUND SPEED>*.

9. FIRMWARE UPGRADE

***Get firmware and upgrade software: www.lefeirc.com or connect lefeirc@163.com

① connect upgrade tool to computer, and install server if needed.

② Connect to correct COM port.(check in Device manager)

③ Click <open> button, and load firmware. do not power FC at this stage!!!

④ Click <write> button, and immediately power on the FC with a battery.

⑤ Wait until progress reaches 100% complete. Disconnect