

**DUALSKY**<sup>®</sup>  
ADVANCED POWER SYSTEMS

# 《FC130》

FC130 3-Axis Gyro  
Instrcution Manual

FC130 3轴飞机陀螺仪使用说明书

Shanghai Dualsky Models co.,Ltd.  
Rm.1016,No.201,Xin Jin Qiao Rd.,Shanghai,China.  
Tel: +86 21 50322162 Fax: +86 21 50322163

**DUALSKY**<sup>®</sup>  
ADVANCED POWER SYSTEMS



**Thank you for selecting Dualsky FC130 3-Axis Gyro. This gyro equipped with latest MEMS gyro chipset, 32-bit MCU and Dualsky original algorithm. It features at mini dimensions, high sensitivity and friendly user interface, see more detailed features in below list:**

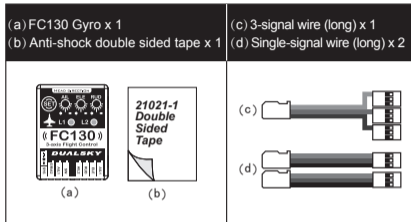
- Mini dimension, MEMS gyro chipset, only 8 gram
- 32-bit high performance ARM MCU
- Original advanced airplane active attitude stabilization algorithm
- Original unique calibration procedure, precisely record mid-point of each channel, stroke and direction
- Support single/double aileron, fly wing and V-tail aircraft
- Independent sensitivity adjustment of each axis
- Support advanced stability and head locking mode
- Optimized for 3D airplanes
- Support Futaba S. BUS Link
- Support mode switch via extra channel, can switch gyro off or switch between different mode
- Programmable via button and LED
- Support analog and digital servo, support HS mode, allow full play of digital servo performance
- Support HV input

**Caution - FC130 will take over all control channels except the throttle channel, if the setting of FC130 is inappropriate, it might cause property damage or damage yourself. Please read the caution items and the rest of this manual carefully before using FC130.**

- When install FC130 to new model, the "initial calibration" must be done, otherwise the FC130 won't work properly

- During test flight, please connect the "Mode" channel, in case of the FC130 is not working properly, you can turn it off in time
- After adjust the trim of one channel, please do the "initial calibration" again
- Recommend to use this gyro on electric powered model airplane or unpowered model glider
- FC130 can only be used on nitro powered airplane which is smaller than 70 grade. Too much vibration will effect the gyro, if the airplane cannot maintain stable attitude, please turn off the gyro immediately
- FC130 need 2~3 sec start-up time after connect to the power, please remain the airplane still during this process
- Servos will only work after the FC130 start-up process finished, this is normal
- Long time standby might cause the gyro "drifting", it's recommend to connect the power to airplane shortly before flight

## Packing List



## Radio equipment

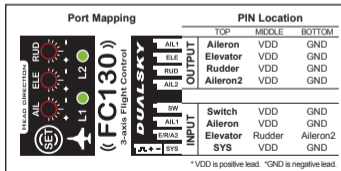
You need a 4-channel or higher transmitter. If transmitter only has 4 channels, FC130 will work under Normal Stability by default, cannot switch mode or switch gyro off during flight. We recommend to use 5 channels or higher transmitter, so CH.5 (usually the GEAR channel) can be used as switching mode channel.

## Install Instruction

1. FC130 install principal:

- Gyro's heading direction must be the same as airplane heading direction
- Gyro should be installed inside of the airplane, close to the receiver and CG
- Install platform must be level, rugged (recommend to use plywood), but do not use servo platform
- Must use the double sided tape comes with FC130, do not use belt, velcro or 3M Dual-Lock
- Do not use foam to cover the gyro
- Gyro cannot be touched by servo horn, linkage or other movable parts
- Gyro must stay away from motor, engine, ESC and batteries
- Gyro cannot be installed at the outside of airplane, such as wings or tail

2. FC130 Port Diagram



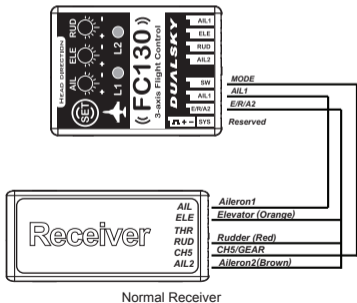
- Input/output signal wires are close to the top of FC130, middle is VDD and bottom is GND

- Input signal supports Futaba S.BUS, only one wire is needed to connect to SYS port on FC130 when using S.BUS link. SYS port has higher priority than other input ports. When SYS port is using, other input ports won't work, transmitter channel sequence must be the same as following chart:

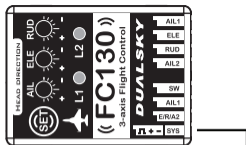
Sequence	CH1	CH2	CH3	CH4	CH5	CH6
Channel	Aileron 1	Elevator	Throttle	Rudder	Mode Switch	Aileron 2

- Caution: Futaba and S.BUS is the trademark and technology of Futaba Corp., we don't provide technical support to future incompatibility.

3. Connect the FC130 to receiver as shown below



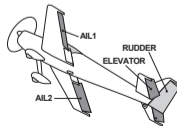
Normal Receiver



S.BUS Receiver

4. FC130 corresponding control surface

- Single and double aileron airplane

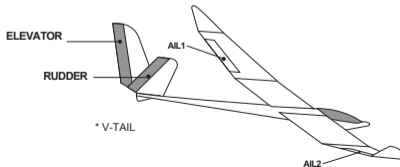
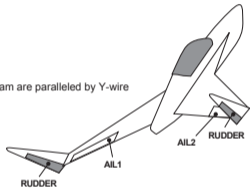


\* Diagram show double aileron airplane

FC130 Output	Single Aileron Airplane	Double Aileron Airplane
AIL1	AIL 1	AIL 1
ELE	ELEVATOR	ELEVATOR
RUD	RUDDER	RUDDER
AIL2	No connection	AIL 2

• Fly wing and V-tail

\* Fly wing, rudders in diagram are paralleled by Y-wire



FC130 Output	Fly wing	V-tail
AIL1	AIL 1	AIL 1
ELE	No connection	ELEVATOR
RUD	Rudder	RUDDER
AIL2	AIL 2	AIL 2

5. FC130 Power Supply

• FC130 supports 4.8V-8.4V power input, share same power input with receiver, input power voltage should meet the requirements of receiver, too. Power supply could be battery or ESC.

**Calibration and ground test**

1. Test flight the airplane without gyro

Airplane must pass test flight before install the gyro. Make sure all control surface are working properly, airplane can fly straight (adjust trim of each channel). Different than multi-copter, each control surface of airplane has it's own direction, neutral point and travel(end point), these settings must be done before install/enable gyro.

2. Gyro calibration

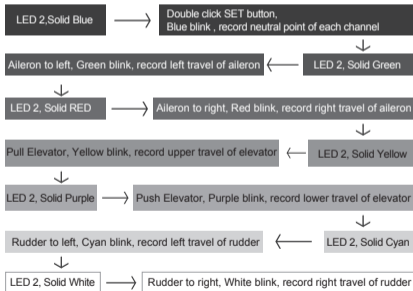
After the test flight is done, the direction, neutral point and stroke of each control surfaces are fixed, we need to do gyro "initial calibration", record these setting data into FC130. If you adjust these setting after, we recommend you do "initial calibration" again to make sure FC130 can control the airplane precisely.



**Caution:** When install FC130 to new model, "initial calibration" must be done, otherwise the unit won't work properly.

### Initial Calibration procedure as follow:

1. If transmitter has set dual rate(D/R), please switch to largest rate
2. Turn on transmitter, then connect the power to model
3. Wait LED1 for solid Green
4. Long press (2 sec) SET button on FC130 to enter the Setting Mode
5. First item of Setting Mode is "initial calibration", LED1 and LED2 are both solid Blue
6. Double click SET button to start the calibration:

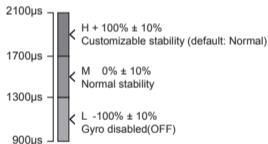


**NOTE:** Double click on SET button to skip unused channel

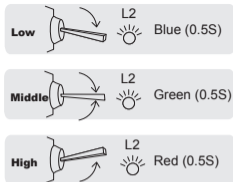
7. After calibration finished, LED1 and LED2 return to solid Blue
8. Final step, long press (2 sec) SET button to save and exit Setting Mode

### 3. Set SW mode switch

Please assign at 3-position switch to SW channel and make sure this channel doesn't have other function. Switch channel pulse width range should be low 900~1300us, middle 1300~1700us, high 1700~2100us. Please refer to the below chart:



After correct setting, LED2 on FC130 will correspond to 3-position switch as shown below. If it is not the same, please change the direction of SW channel.



Switch position and corresponded working mode:

Switch position	Gyro Mode
Low	Not working
Middle	Normal Stability
High	Default - Normal Stability Mode can be changed in FC130 setting

If SW channel is not connected, FC130 will work under Normal Stability mode by default. This mode can be set in FC130, but it cannot be turned off. (Not recommended)

#### 4. Ground Test

- After each "initial calibration", please do a ground test
- Test if the SW mode switch is working properly. Do not turn on the motor/engine, toggle the SW mode switch on the transmitter to middle or high position (Low is gyro off), LED2 will turn Green for 0.5 sec, now FC130 is under Normal Stability.

- Test gyro moving direction. Move the model on each axis, corresponded control surface should have excursion the same as moving direction. If moving direction is different, please run the "initial calibration" again.
- Test transmitter moving direction. Toggle the stick (except the throttle) to observe if each control surface moving at correct direction.

#### FC130 Setting

- How to enter Setting Mode: Turn on radio controller, move the throttle to lowest position; turn on power to the model, wait until the L1 LED finishes flashing Green and then changes to RED (Now the flight control is in Lock Mode); press the "SET" button on the flight control to enter Setting Mode. After you enter Setting Mode, L1 displays the corresponding SETTING ITEM menu attributes (color), and L2 displays the corresponding SETTING VALUE menu attribute (color).
- "SET" Button usage:
  - 1) Long Press (more than 2 sec) under Lock Mode: enter Setting Mode
  - 2) Single Click under Setting Mode: switch between SETTING ITEM
  - 3) Double Click (finish within 0.5 sec) under Setting Mode: change SETTING VALUE
  - 4) Long Press (more than 2 sec) under Setting Mode: Save and Quit to Lock Mode
- Please check the below chart for all settings

L1	
Setting Item	
Blue	Calibration Procedure
Green	Flying Mode
Red	Maximum Rolling Velocity
Yellow	Airplane Type
Purple	Install Direction
Cyan	Servo Type(PWM)
White	Factory Reset



L2			
Setting Value			
Blue	Green	Red	Yellow
Double click to start the procedure			
Normal Stability Aileron - normal Elevator - normal Rudder - normal	Advanced Stability Aileron - heading locked Elevator - heading locked Rudder - normal	3D Stability Aileron - heading locked Elevator - heading locked Rudder - heading locked	
3600ps	540dps	720dps	
Normal	Fly Wing	V-tail	Face Left
Face Up	Face Down	Face Left	Face Right
Analog(90HZ)	Digital(120HZ)	Digital(200HZ)	
Double Click to Reset			

● Caution: Some settings will take effect after the FC130 is restarted. Cut the power to the FC130 and reconnect after 5 seconds to apply the new settings

## Adjust the sensitivity

Different airplane, different flight speed need different Gain. Via 3 potentiometers on the FC130, you can adjust the Gain of each axis easily. Rotate clockwise will increase the gain, rotate count-clockwise will decrease the Gain. Please refer to below diagram.



- The default Gain of FC130 is suitable for 50 grade EP airplane, if use on small airplane, Gain might be too low. Please increase Gain accordingly.
- Correct Gain setting requires test flight to determine, it's recommend to use more conservative Gain (low) during test flight.
- At safety altitude, accelerate the airplane to its maximum speed, observe if there are oscillation in Pitch, Roll and Yaw axis. If there are oscillation, it indicates the gain is too high, please slow down the airplane or turn off the gyro, adjust the gain after landing.
- Please do not adjust the Gain too much a time, it's recommend to adjust 5-10 degrees a time.
- Gain too low will cause the airplane become blunt, a basic principal is --- Gain cannot be too low to decrease the maximum travel of control surface.
- Some 3D movements require high Gain under low speed, these kind of Gain is not good for high speed flight. It's recommend to use switch to control the Gyro compensate timing.