

Operation Manual

IG3XR



3-Axis Stabilization System for Fixed Wing Model Aircraft

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Introduction

Congratulations on your new HG3XA gyro system for airplane models! This manual contains important information that will help you achieve the best user performance and control

possible. Please read the instructions contained here carefully and in full before attempting to operate this system.

Safety Instructions

As with any Hitec product, users are asked to take special care to observe the following reminders while operating or in contact with their HG3XA.

- Limit the use of this HG3XA to its intended purpose and according to the guidelines set forth in this manual.
- Accurately follow any installation and set-up guidelines.
- Confirm correct polarity when connecting the servos and signal inputs.

- Ensure that all connected remote control components are approved for the same voltage as your HG3XA. Excessive

voltage may cause damage to the gyro or result in further destruction of your model.

- Ensure sufficient power input.
- **NOTE:** Use of a gyro system involves constant control commands being sent to the servo. This more frequent communication may lead to increased wear of the servos. Please check that your servos are operating correctly on a regular basis.

Definitions

Gyro Gain: The effort by the gyro to compensate for a change in movement along an axis. High Gain = more effort whereas low gain = less effort.

Yaw Axis: The nose of the plane moves left and right (Rudder) along the yaw axis.

Roll Axis: One wing moves up while other moves down (Ailerons) along the roll axis.

Pitch Axis: The nose of the plane moves up and down (Elevator) along the pitch axis.

Standard Mode: When the gyro is compensating for unwanted changes in yaw, roll and pitch. i.e. if the nose of the plane starts to pitch up, the gyro inputs down elevator.

Heading Hold Mode: Maintains the last yaw, roll and pitch attitudes of the airplane. i.e. if the airplane is flown into knife edge and Heading Hold is on, it will maintain knife edge.

Product Layout

This set contains:

- 1 gyro system
- 4 connecting cables
- 3 adhesive pads

HG3XA Overview

Receiver "IN" Area

- 1 Flight mode changeover switch
- 2 Aileron
- 3 Elevator
- 4 Rudder

Servo "OUT" Area

- 5 Aileron
- 6 Elevator
- 7 Rudder

Model Type Selection (jumper)

- 8 J1 – V-tail
- 9 J2 – Delta wing or flying wing
- 10 J3 – Standard aircraft model

Gyro Gain Adjustment

- 11 Potentiometer rudder
- 12 Potentiometer elevator
- 13 Potentiometer aileron

LED Display

- 14 Red LED
- 15 Blue LED



LED Display Overview

Status	LED display	Description
Initialization	The blue and red LEDs flash rapidly for three seconds after switching on the gyro.	Initialized. Do not move the aircraft until initialization has been completed!
	Blue LED flashes after initialization.	Initialization successful.
	Red LED flashes rapidly after initialization.	Initialization failed. Undefined model type. Check the adjustments J 1-2-3.
Operation	Blue LED illuminated permanently.	Standard mode. Ready for flight.
	Red LED illuminated permanently.	Heading hold mode. Ready for flight.
	Both LEDs are off.	Gyro is deactivated. Ready for flight.

Specifications

Voltage range	5 - 6V DC
PWM output	50Hz, or 20ms
PWM signal	1520±500µs
Full scale range	970~2070µs

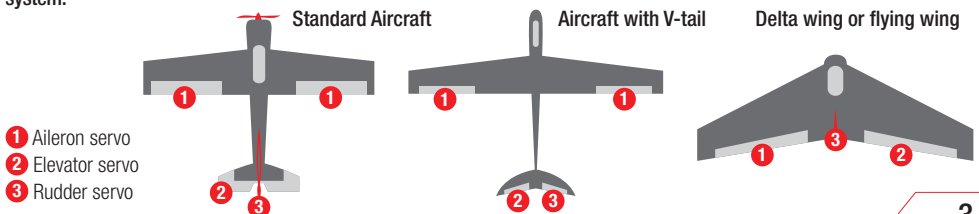
Gyro sample rate	1KHz
Operating temperature	-40°C to 85°C
Dimensions	47 x 33 x 14 mm
Weight	11 g

Features

Your HG3XA makes it possible to toggle between three different flight modes while your model is airborne, "Off" mode, "Standard" mode and "Heading Hold" mode.

Users of the HG3XA also enjoy specialty optimization for 3D flight, independent gyro adjustment and gyro reversing for each channel, and a small, lightweight design suitable for smaller aircraft.

The following 3 model types are supported for use with this system:



Before Use

Prior to operating your HG3XA for the first time, please review the instructions and reminders below and confirm that any rules for use have been met.

- Read this manual in detail and in its entirety. To set-up your HG3XA, follow the instructions given step-by-step as described.
- Reset the middle position of the gyro system after installing the gyro, replacing your remote control system, or re-adjusting the trimming (sub-trim) of the transmitter. To do this, toggle the 3-way switch on your remote control system twice between Standard and Heading Hold mode for one second. The blue LED will flash rapidly and once the adjustment has been saved, the blue LED will flash

again. **Note:** Failure to reset will engage Heading Hold mode automatically.

- The HG3XA contains mixing functions for flying wing and delta wing aircraft as well as aircraft with a V-tail. If one of these mixing functions (aircraft types) is selected at the gyro, neither a V-tail nor a delta wing mixer can be activated on the transmitter.
- The blue and red LEDs flash rapidly for three seconds after switching on the gyro system. Do not move your model during this period. Wait until initialization has been completed.

Installation and Assembly

Use double-sided adhesive tape to mount the gyro system in the aircraft. Make sure the HG3XA is firmly attached to the airplane at your model's center of gravity and ensure that:

1. The long side of the gyro is parallel to the roll axis of the aircraft (in the direction of forward flight)
2. That the gyro is level horizontally with the roll axis of the aircraft.

Fig. 2:

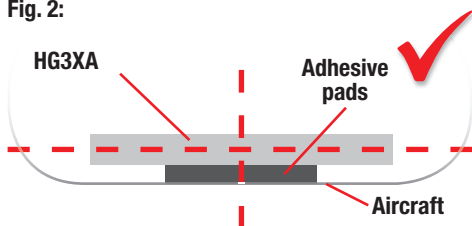
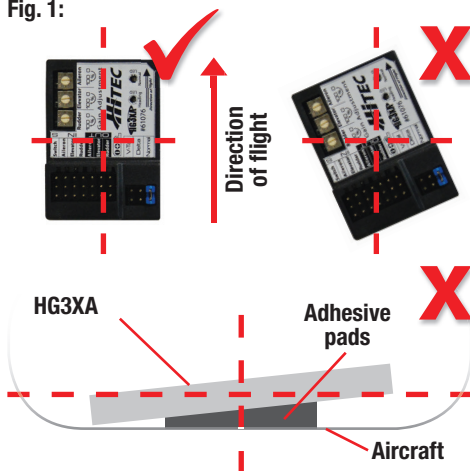


Fig. 1:



Cabling

Once you have installed the HG3XA, connect the channels of the aileron, elevator, and rudder from the receiver and the 3-position switch function to the upper row of pins marked

The throttle servo or the electronic speed control is usually connected to the throttle channel of the receiver. Note that there is no connection to the HG3XA.

“IN.” Next, connect the servos to the lower row of pins marked “OUT.” **For pin assignment, refer to Chapter 2.**

If your plane has 2 aileron servos you will connect only one to the HG3XA and to connect the second servo directly to your receiver as normal. You can still secure a potential aileron differentiation. The gyro effect around the pitch axis is usually still sufficient.

Model Selection

The HG3XA uses a 3-bit jumper (J 1-2-3) for model type selection. Adapt the adjustments J1, J2, and J3 as specified in the table according to your type of aircraft. "0" signifies

open and "1" denotes closed for the selected aircraft.

Model type	Jumper setting			Servo connection		
	J1	J2	J3	OUT-1	OUT-2	OUT-3
Gyro off	0	0	0	-	-	-
Standard aircraft	0	0	1	Aileron servo	Elevator servo	Rudder servo
Delta wing or flying wing	0	1	0	Left wing servo	Right wing servo	Rudder servo
Aircraft with a V-tail	1	0	0	Aileron servo	Left tail servo	Right tail servo

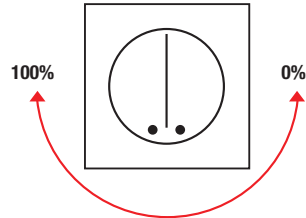
Gyro Gain Adjustment

The HG3XA provides three trimming potentiometers to adjust the gyro gain of the aileron, the elevator, and the rudder separately. Use a small flathead screwdriver to complete these changes.

Increase the gyro gain by turning the potentiometer clockwise. Decrease the gyro gain by turning the potentiometer counterclockwise. The ideal volume setting is determined by several factors, including the size of the fuselage, the weight of your model, or even the power

allocation used and the size of the rudder surfaces.

We strongly suggest adjusting the gain to a lower volume for the initial flight. The adjustment is immediately active – without the need to restart. Finely adjust the potentiometer for subsequent flights as desired.



When making adjustments, always disassemble the propeller or disconnect the drive motors from the flight control system.

3-Switch Setting

Define a 3-way switch at your transmitter. The channel for the 3-way switch from the receiver is connected to pin 1: flight mode changeover switch "IN." Use this 3-way switch to change the flight mode while the aircraft is airborne. Refer to your transmitter manual for assigning a gyro to a 3-position switch.

If the "Channel Switch" slot has not been assigned, the default Standard mode will engage. This is not recommended, as it is then impossible to switch off the gyro and any malfunction might cause your model to crash - particularly if the gyro in the model moves from its defined position.



When using a 2-way switch, you can toggle between two of the three available modes. These modes differ according to the type of transmitter.

When operating the HG3XA, the current flight mode is indicated by illuminated LEDs:

- **Standard Mode:** Blue LED illuminated
- **Heading Hold Mode:** Red LED illuminated
- **Gyro Off (system deactivated):** No LED illuminated

Servo Middle Adjustment, Neutral Rudder Position

Center all the rudders by adjusting the length of the ball linkage rod or setting it correctly using the trim keys (or sub-trim) of the transmitter. You will need to re-adjust the middle

position of the gyro system. Toggle the 3-way switch twice for one second between Standard and Heading Hold modes.

Gyro Direction Adjustment

! Make sure the gyro system is facing the direction of forward flight prior to take off or you may lose control of your airborne model, causing it to crash in worst case scenarios. If necessary, deactivate the gyro.

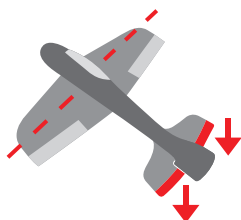
To determine if the Gyro Direction is correct, switch on the transmitter and Model (remembering to remove the propeller first) and put the Gyro in Standard Mode.

Note: Right/left correspond to the view from standing behind

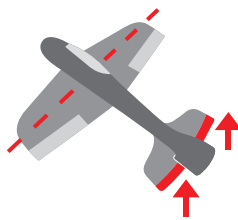
the model.

Test the following scenarios in standard mode:

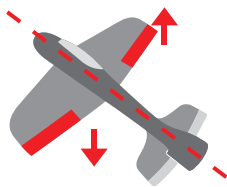
- 1** Lift the nose of the model (pitch axis). The elevator should move down.



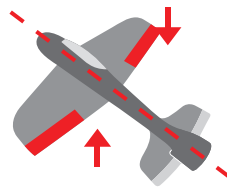
- 2** Lift the tail of the model (pitch axis). The elevator should move up.



- 3** Rotate the model left around the roll axis (left wing down, right wing up). If the left aileron servo is attached to the Gyro, the left aileron moves down. If the right aileron servo is attached to the Gyro, the right aileron moves up.



- 4** Rotate the model right around the roll axis (left wing up, right wing down). If the left aileron servo is attached to the Gyro, the left aileron moves up. If the right aileron servo is attached to the Gyro, the right aileron moves down.



- 5** Rotate the nose of the model to the right (yaw axis). The rudder should move left.



- 6** Rotate the nose of the model to the left (yaw axis). The rudder should move right.



If the gyro responds incorrectly, the direction must be changed. See the reversing instructions that follow:

Reversing Instructions

1. Remove the jumper from the HG3XA.

2. Switch on the transmitter and then your model.

3. If the blue and red LED flash once, the HG3XA is in reverse.

4. Reverse Setting Menu:

- a. The LEDs start to flash in a rotary pattern after one second. The color indicates the current gyro system setting. Blue represents "Standard" and red "Reverse."
- b. **Aileron:** the blue or red LED flashes once every second for a total of five times. While the LED is flashing, you can change the direction of the aileron function by moving the left-hand **rudder stick** to the left or right. Hold the **rudder stick** in the end position until the color of the LED changes and the setting has been saved.
- c. **Elevator:** the blue or red LED flashes twice every second for a total of five times. While the LED is flashing, you can change the direction of the elevator by moving the left-hand **rudder stick** to the left or right. Hold the **rudder stick** in the end position until the color of the LED changes and the setting has been saved.
- d. **Rudder:** the blue or red LED flashes three times every second for a total of five times. While the LED is flashing, you can change the direction of the rudder by moving the left-hand **rudder stick** to the left or right. Hold the **rudder stick** in the end position until the color of the LED changes and the setting has been saved.

5. Change the control directions of the HG3XA:

- a. To change the control directions of the gyro, move the left-hand rudder stick to the left or right. While the LEDs are flashing, you can toggle between the "Standard" and "Reverse" settings.
- b. The LEDs continue to flash until you release the rudder stick.

6. Exit Set-up mode:

You can exit the Set-up mode at any time by switching off the device. Remember to re-insert the jumper in the correct slot for model type selection.

Warranty and Service

TWO YEAR LIMITED WARRANTY

For a period of two years from the date of purchase HITEC RCD USA, INC. shall REPAIR OR REPLACE, at our option, defective equipment covered by this warranty, otherwise the purchaser and/or consumer is responsible for any charges for the repair or replacement of the product. This warranty does not cover cosmetic damages and damages due to acts of God, accident, misuse, abuse, negligence, improper installation, or damages caused by alterations by unauthorized persons or entities. This warranty only applies to the original purchaser of this product and for products purchased and used in the United States of America, Canada and Mexico. Plastic cases are not covered by this warranty.

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2. Fill out the service request form completely and include a copy of your original receipt showing the purchase date.
3. Package your product in its original packaging or use a suspension-type packaging (foam peanuts or crumpled newspaper). Hitec RCD shall not be responsible for goods damaged in transit.
4. Ship prepaid (COD or postage-due returns will not be accepted) via a traceable common courier (UPS, insured parcel post, FedEx, etc.) to:

**Hitec RCD USA, Inc., Customer Service Center,
12115 Paine St., Poway CA 92064**



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