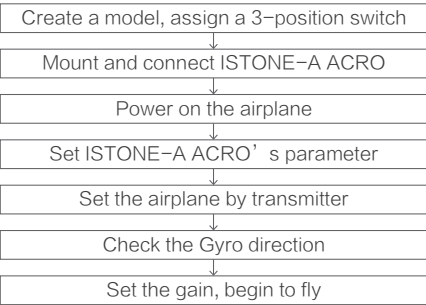Thank you for purchasing our products. ISTONE−A ACRO is a 6−axis Gyro & Stabilizer for airplane. It is suitable for normal wing, fly−wing, and V−tail airplanes.

## Packing List

ISTONE−A ACRO Gyro & Stabilizer × 1    3−signal wire × 1
Anti−shock double sided tape × 2    Single−signal wire × 1

## Quick Start

Before installing, make sure:
· All the surfaces are well connected to the servos by the linkage rods.
· Install the receiver and bind it to your transmitter in advance.
· All channel directions and trims are set to the correct position.

- Create a model, assign a 3−position switch
- Mount and connect ISTONE−A ACRO
- Power on the airplane
- Set ISTONE−A ACRO's parameter
- Set the airplane by transmitter
- Check the Gyro direction
- Set the gain, begin to fly

Follow these steps to complete your first−time installation.
1. Switch on the transmitter and create a new airplane model. Assign a 3−position switch for the flight mode control.
2. Mount the ISTONE−A ACRO on the airframe and connect its required channels to the receiver and the servos.
3. Place the airplane on the ground and power it on, **LED1** and **LED2** will start fast green flashing, which means it is calibrating the gyro and the sticks, don't move the airplane and the sticks during this period. After a successful initialization, **LED2** is off, and **LED1** displays the current flight mode.
4. Long press **SET** button (2 sec) to enter setting mode, then set the mounting direction and the wing type.
5. Switch to **Gyro Off Mode**. Adjust the neutral position for all servos. Check the direction of movement of the servos by moving the stick one by one. If the servo moves in an opposite direction, reverse it on your transmitter (for details, please refer to the user manual of transmitter).
6. Switch to **Normal Mode**, check the gyro direction one by one, reverse it if the gyro reacts in a wrong direction.
7. Adjust the gain, begin your first flight.

## Installation

ISTONE−A ACRO should be mounted on the platform inside the airframe by using one of the provided double−sided tapes. The installation position should follow the principles below.
· Close to the receiver and center of gravity (CG).
· ISTONE−A ACRO's heading direction must be the same as the airplane's heading direction.
· Installing platform must be parallel to horizontal tail.

ISTONE−A ACRO can be attached flat or upright. There are four different mounting directions: face up, face down, face left, and face right, as shown in the figure.



Face up    Face down
Face left    Face right
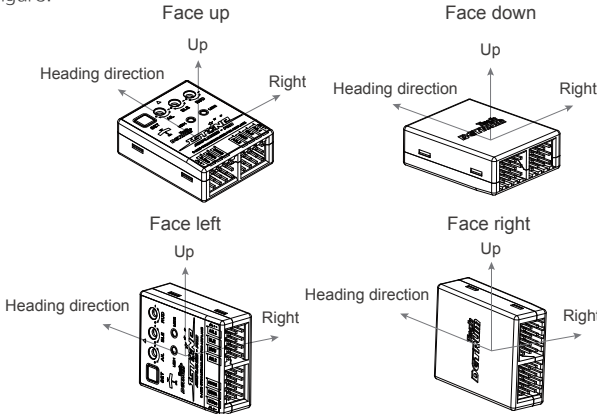
Installation precaution:
· You need only one piece of the double−sided tapes each time. A soft or thick mounting may hinder the performance of the gyro.
· Please use the double sided tape comes with ISTONE−A ACRO, do not use hot−melt glue or belt.
· Please make enough space around ISTONE−A ACRO, stay away from motor, ESC, and battery, cannot be touched by servo horn, linkage, or other movable parts.

## Connection

## Port Descriptions

The port descriptions of ISTONE−A ACRO are listed in the table below.
For each channel (except **E/R/A**), input/output signal wires are close to the top of ISTONE−A ACRO, middle is VDD and bottom is GND. When wiring, please check the line sequence and all the connectors, make sure that all of them are connected firmly and correctly.

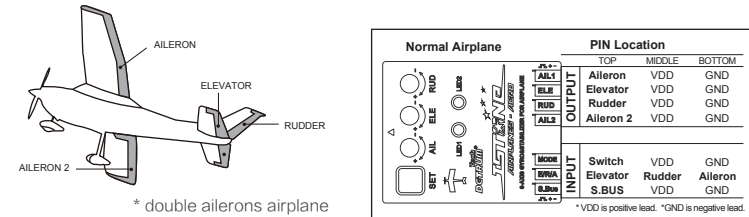| Port ID | Descriptions |
|---|---|
| Outputs | |
| AIL1 | Connect to aileron servo |
| ELE | Connect to elevator servo |
| RUD | Connect to rudder servo |
| AIL2 | Connect to the second aileron servo |
| Inputs | |
| MODE | Connect to the mode channel of receiver |
| E/R/A | Connected to elevator, rudder, and aileron channels of the receiver by a 3−signal wire |
| S.Bus | Connect to Futaba's S.Bus input |

## Connecting with Receiver

ISTONE−A ACRO supports a normal receiver or a Futaba's S.Bus receiver. S.Bus input port has higher priority than other input ports. When S.Bus port is using, other input ports won't work.
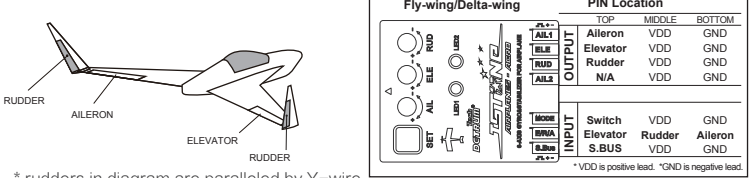


ISTONE−A ACRO    ISTONE−A ACRO
Normal Receiver    S.BUS Receiver
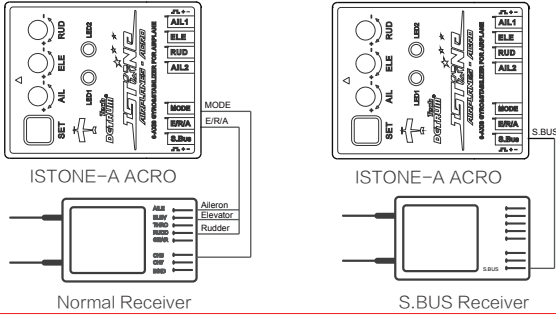
· When using a normal receiver, **MODE** channel of ISTONE−A ACRO is connected to mode channel of the receiver, and **E/R/A** channel is connected to elevator, rudder, and aileron channels of the receiver by a 3−signal wire.

**Note:**
The mode channel of the receiver should be mapped to a 3−position switch of the transmitter. The diagram is an example. Please connect the **MODE** channel according to the actual receiver and transmitter that you used.

· When using a Futaba's S.Bus receiver, you only need to connect the receiver's **S.Bus** output pin to S.Bus port on ISTONE−A ACRO, do not need to connect other inputs of ISTONE−A ACRO anymore.
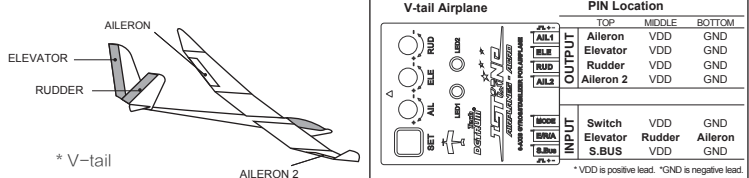
## Connecting with Control Surfaces

· Normal type airplane with single or double ailerons



* double ailerons airplane

| Normal Airplane | PIN Location | | |
|---|---|---|---|
| | TOP | MIDDLE | BOTTOM |
| AIL1 | Aileron | VDD | GND |
| ELE | Elevator | VDD | GND |
| RUD | Rudder | VDD | GND |
| AIL2 | Aileron 2 | VDD | GND |
| | Switch | VDD | GND |
| | Elevator Rudder | | Aileron |
| S.BUS | VDD | | GND |

*VDD is positive lead. *GND is negative lead.

· Flying−wing (delta wing)



* rudders in diagram are paralleled by Y−wire

| Fly-wing/Delta-wing | PIN Location | | |
|---|---|---|---|
| | TOP | MIDDLE | BOTTOM |
| AIL1 | Aileron | VDD | GND |
| ELE | Elevator | VDD | GND |
| RUD | Rudder | VDD | GND |
| AIL2 | N/A | VDD | GND |
| | Switch | VDD | GND |
| | Elevator Rudder | | Aileron |
| S.BUS | VDD | | GND |

*VDD is positive lead. *GND is negative lead.

· V−tail airplane



* V−tail

| V-tail Airplane | PIN Location | | |
|---|---|---|---|
| | TOP | MIDDLE | BOTTOM |
| AIL1 | Aileron | VDD | GND |
| ELE | Elevator | VDD | GND |
| RUD | Rudder | VDD | GND |
| AIL2 | Aileron 2 | VDD | GND |
| | Switch | VDD | GND |
| | Elevator Rudder | | Aileron |
| S.BUS | VDD | | GND |

*VDD is positive lead. *GND is negative lead.

## Setting Mode Switch

ISTONE−A ACRO provides three different flight modes. Connect a switch channel to the **MODE** port. Then you can switch the flight mode with it.

Use five channels or higher transmitters, assign a 3−position switch to the mode channel and make sure that channel does not have other function. Switch channel pulse width range should be low (850~1250)μs, middle (1350~1650)μs, high (1750~2150)μs. If the mode channel is not connected, or the positive pulse width of mode channel is out of the range that mentioned above, the ISTONE−A ACRO will work in **Normal Mode**.

You can switch the flight mode with the mode switch on transmitter. The status of **LED1** indicates the current flight mode. Please see the table.

| Position | LED1 | Flight Mode |
|---|---|---|
| Low | Blue | Normal Mode |
| Middle | Red | Gyro Off Mode |
| High | Purple | Aerobatic Mode |

**Caution:**
If the switch operation is the opposite of the above table, please reverse mode channel for correct switch operation.

The descriptions of the flight modes are as follows.
· **Normal Mode**: In this mode, the gyro will sense angular velocity on each axis and make a momentary reaction. The normal mode is suitable for all types of airplane. It can effectively improve the stability of your airplane, especially on a windy day.
· **Gyro Off Mode**: Choose this mode to disable the gyros for all channels. The airplane will be completely under the control of the transmitter, act the same as without an ISTONE−A ACRO. Generally, it is only used to test.
· **Aerobatic Mode**: Choose this mode to lock the airplane to its previous attitude if there is no command sent from the transmitter in a flight. This mode can effectively help you to accomplish a aerobatic flight. Operate the sticks in this mode, ISTONE−A ACRO won't affect the operation and can improve the stability of the airplane. Once release the sticks, ISTONE−A ACRO will save the previous flight attitude and lock the airplane to this attitude.
Flying in **Aerobatic Mode**, do not drastically adjust the trims, excessive trims will affect the judgment of neutral position for the transmitter. Please set the trims during test, and then turn off and power on.

## Setting the Parameters

Setting Method:
1. Enter setting mode.
(1) Turn on the transmitter, move the throttle to lowest position.
(2) Place the airplane on the ground and power it on, **LED1** and **LED2** will start fast green flashing, which means it is calibrating the gyro and the sticks, don't move the airplane and the sticks during this period. Otherwise, fail to calibrate, **LED1** and **LED2** will start slow red flashing. After a successful initialization, **LED2** is off, and LED1 displays the current flight mode.
After powering on, if **LED1** and **LED2** start fast red flashing, it means the transmitter is off.
(3) After a successful initialization, long press (more than 2 sec) **SET** button, enter setting mode.
After entering setting mode, **LED1** displays the corresponding setting item menu attribute (color), and **LED2** displays the corresponding setting value menu attribute (color). For details, please see the table.
Single click **SET** button to switch between setting item, double click **SET** button to change setting value.

| LED1 | Item | LED2 | Value |
|---|---|---|---|
| Blue | Mounting Direction | Blue | Face up |
| | | Green | Face down |
| | | Red | Face right |
| | | Yellow | Face left |
| Red | Wing Type | Blue | Normal wing |
| | | Green | Flying−wing (delta wing) |
| | | Red | V−tail |

2. Set the mounting direction.
Single click **SET** button, switch the attribute (color) of **LED1**. When **LED1** displays blue, double click **SET** button, switch the attribute (color) of **LED2** to change the mounting direction.
Set the value in accordance with the actual mounting direction, otherwise the airplane cannot work properly.
3. Set the wing type.
Single click **SET** button, switch the attribute (color) of **LED1**. When LED1 displays red, double click **SET** button, switch the attribute (color) of **LED2** to change the wing type.
Set the value in accordance with the actual wing type, otherwise the airplane cannot work properly.
4. After setting all the parameters, long press (more than 2 sec) **SET** button under setting mode, save and quit to flight mode.

## Adjusting the Gain

There are three potentiometers for aileron (roll), elevator (pitch), and rudder (yaw) channel to physically adjust the correction direction and gain setting. You have to adjust the settings manually according to your airplane to get the best flying experience. If the gain is set too high, there is a result of over amplification of the gyros, this rapid back and forth movement can make the airplane hard to control. But if the gain is too low, will cause the airplane become blunt. A basic principle: gain cannot be too low to decrease the maximum travel of control surface.

It is recommended to use more conservation gain (low) during test flight and then increase the gain gradually.
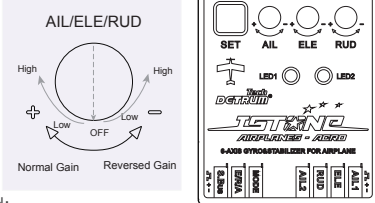


Setting method:
1. Press and hold **SET** button, power on the airplane, then release the button to enter gain setting. LED1 and LED2 will turn blue.
2. Use a flat−blade screwdriver to adjust the potentiometers for aileron, elevator, and rudder channels.
· If the servo direction is normal, adjust the potentiometer in positive direction (+). If the servo direction is reversed, adjust in negative direction (−).
· When the potentiometer is in neutral position, the gain is the lowest (off). The larger the angle is, the higher the gain is.
· Please do not adjust the gain too much at a time, it is recommended to adjust 1~10 degrees at a time.
· The direction of servo movement indicates the direction of the gain, and the servo horn indicates the value of the gain.
3. After setting the gain, double click **SET** button to save the settings.

## Appendix

### LED Descriptions

| LED1 | LED2 | Descriptions |
|---|---|---|
| Flight Mode | | |
| Blue | Off | Normal Mode |
| Red | Off | Gyro Off Mode |
| Purple | Off | Aerobatic Mode |
| Aerobatic Mode | | |
| Red, fast flashing | Red, fast flashing | The radio is off |
| Green, fast flashing | Green, fast flashing | It is calibrating the gyro and the stick |
| Red, slow flashing | Red, slow flashing | Fail to calibrate |
| Setting the Parameter | | |
| Blue | Blue | The mounting direction is **face up** |
| | Green | The mounting direction is **face down** |
| | Red | The mounting direction is **face right** |
| | Yellow | The mounting direction is **face left** |
| Red | Blue | Normal wing |
| | Green | Flying−wing (delta wing) |
| | Red | V−tail |
| Adjusting the Gain | | |
| Blue | Blue | Enter gain setting |

### Specifications

| Items | Specifications |
|---|---|
| Main Controller | 32−bit MCU |
| Sensor | 6−axis gyro |
| Gyro Scale Range | −2000dps ~ +2000dps |
| Accelerometer Scale Range | −4g ~ +4g |
| Input Signal | PWM，Futaba S.Bus |
| Output Signal | PWM (71.4Hz) |
| Input Voltage | 4.8V ~ 7.4V |
| Operating Temp | −20℃ ~ 70℃ |
| Size | 36.5mm*29.4mm*12.4mm |
| Weight | 8g |