

# TGY-i4X

**DIGITAL PROPORTIONAL RADIO  
CONTROL SYSTEM**

## INSTRUCTION MANUAL





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Thank you for purchasing our product, an ideal radio system for beginners or experienced users alike.

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Read this manual carefully before operation in order to ensure your safety, and the safety of others or the safe operation of your system.

If you encounter any problem during use, refer to this manual first. If the problem persists, contact your local dealer or visit our service and support website for help:

**[www.hobbyking.com](http://www.hobbyking.com)**

# 1. Safety

## 1.1 Safety Symbols

Pay close attention to the following symbols and their meanings. Failure to follow these warnings could cause damage, injury or death.



**Danger** • Not following these instructions may lead to serious injuries or death.



**Warning** • Not following these instructions may lead to major injuries.



**Attention** • Not following these instructions may lead to minor injuries.

## 1.2 Safety Guide



**Prohibited**



**Mandatory**



- Do not use the product at night or in bad weather like rain or thunderstorm. It can cause erratic operation or loss of control.
- Do not use the product when visibility is limited.
- Do not use the product on rain or snow days. Any exposure to moisture (water or snow) may cause erratic operation or loss of control.
- Interference may cause loss of control. To ensure the safety of you and others, do not operate in the following places:
  - Near any site where other radio control activity may occur
  - Near power lines or communication broadcasting antennas
  - Near people or roads
  - On any pond when passenger boats are present
- Do not use this product when you are tired, uncomfortable, or under the influence of alcohol or drugs. Doing so may cause serious injury to yourself or others.
- The 2.4GHz radio band is limited to line of sight. Always keep your model in sight as a large object can block the RF signal and lead to loss of control.
- Never grip the transmitter antenna during operation. It significantly degrades signal quality and strength and may cause loss of control.
- Do not touch any part of the model that may generate heat during operation, or immediately after use. The engine, motor or speed control, may be very hot and can cause serious burns.



- Misuse of this product may lead to serious injury or death. To ensure the safety of you and your equipment, read this manual and follow the instructions.
- Make sure the product is properly installed in your model. Failure to do so may result in serious injury.
- Make sure to disconnect the receiver battery before turning off the transmitter. Failure to do so may lead to unintended operation and cause an accident.
- Ensure that all motors operate in the correct direction. If not, adjust the direction first.
- Make sure the model flies within a certain distance. Otherwise, it could cause loss of control.

## 2. Introduction

The TGY-i4X transmitter and TGY-i4X receiver constitute a 4-channel 2.4GHz AFHDS 2A digital proportional computerized R/C system. It is compatible with quadcopter.

### 2.1 System Features

The AFHDS 2A (Automatic Frequency Hopping Digital System Second Generation) developed and patented by hobbyking is specially developed for all radio control models. Offering superior protection against interference while maintaining lower power consumption and high reliable receiver sensitivity, hobbyking's AFHDS technology is considered to be one of the leaders in the RC market today.



#### **Bidirectional Communication**

Capable of sending and receiving data, each transmitter is capable of receiving data from temperature, altitude and many other types of sensors, servo calibration and i-BUS Support.



#### **Multi-channel Hopping Frequency**

This systems bandwidth ranges from 2.408GHz to 2.475GHz. This band is divided in 135channels. Each transmitter hops between 16 channels (32 for Japanese and Korean versions) in order to reduce interference from other transmitters.



#### **Omni-directional Gain Antenna**

The high efficiency Omni-directional high gain antenna cuts down on interference, while using less power and maintaining a strong reliable connection.



#### **Unique ID Recognition System**

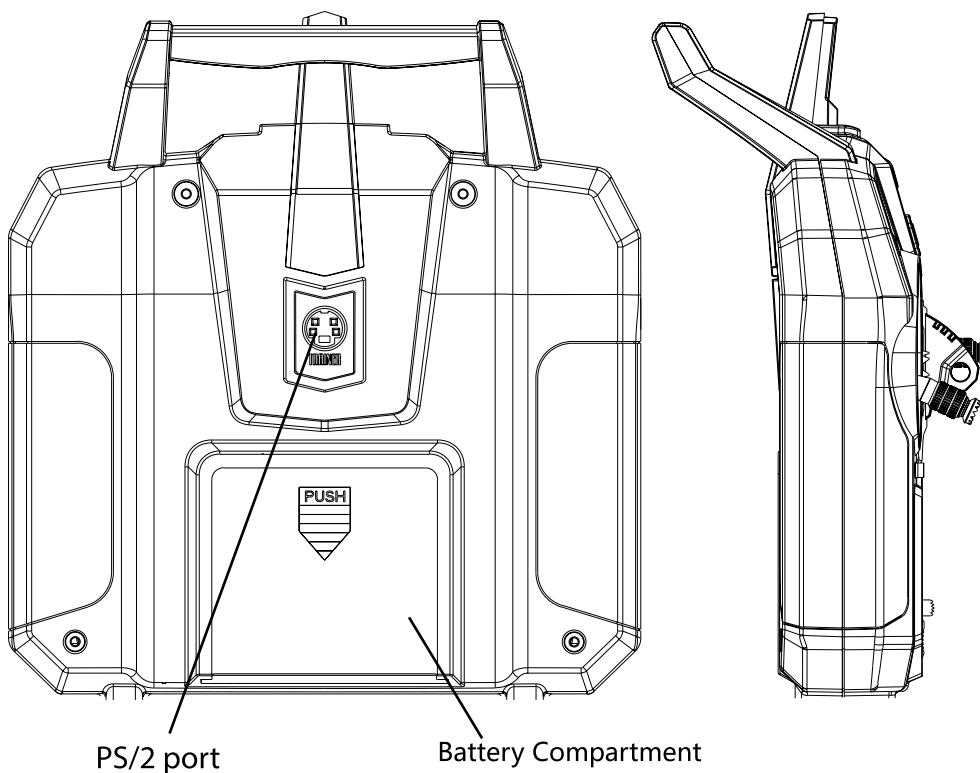
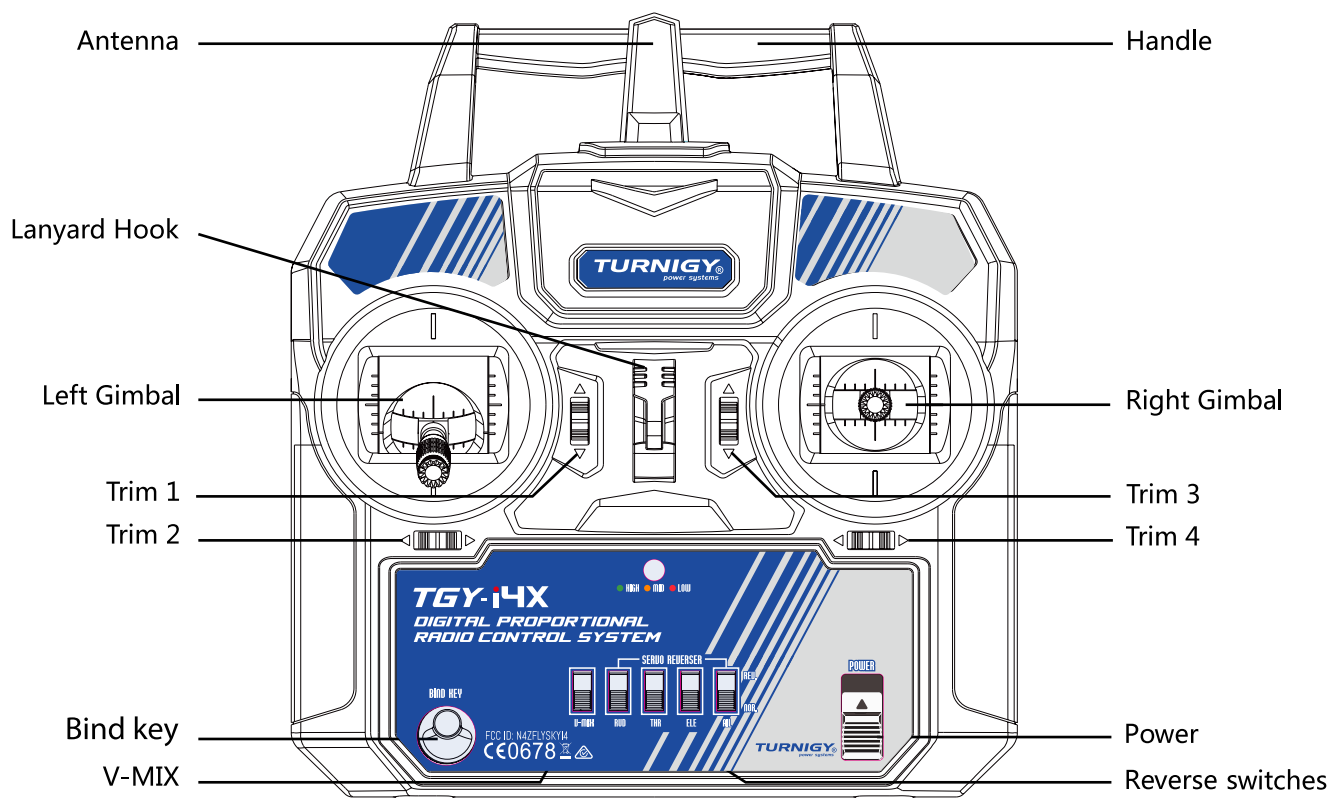
Each transmitter and receiver has it's own unique ID. Once the transmitter and receiver have been paired, they will only communicate with each other, preventing other systems accidentally connecting to or interfering with the systems operation.



#### **Low Power Consumption**

The system is built using highly sensitive low power consumption components, maintaining high receiver sensitivity, while consuming as little as one tenth the power of a standard FM system, dramatically extending battery life.

## 2.2 Transmitter Overview



### 2.2.1 Transmitter Antenna

Precautions:

- For best signal quality, make sure that the antenna is at about a 90 degree angle to the model. Do not point the antenna directly at the receiver.
- Never grip the transmitter antenna during operation. It significantly degrades the RF signal quality and strength and may cause loss of control.

### 2.2.2 Gimbals/Sticks

There are two sticks on the transmitter and two preset modes for the functions of the sticks.

### 2.2.3 Status Indicator

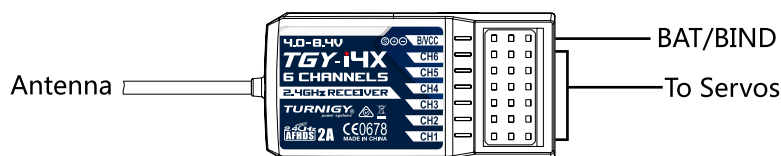
The status indicator is used to indicate the power and working status of the transmitter.

- Off: the transmitter is powered off.
- Green light: Battery is fully charged (5.3-6V).
- Orange light: Battery is half full (4.8- 5.3V).
- Red light: Low battery ( 4.2-4.8V).

### 2.2.4 Trims

There are 4 trims affecting stick functionality, one for ailerons (Channel 1), elevator (Channel 2), throttle (Channel 3) and rudder (Channel 4). Each time a trim is toggled, the trim will move one step. It is possible to make quicker trim adjustments by holding the trim in the desired direction. When the trim position reaches the middle, the transmitter beeps in a higher tone.

## 2.3 Receiver Overview



### 2.3.1 Receiver Antenna



Attention

- For best signal quality, ensure that the receiver is mounted away from motors or metal parts.

### 2.3.2 Status Indicator

The status indicator is used to indicate the power and working status of the receiver.

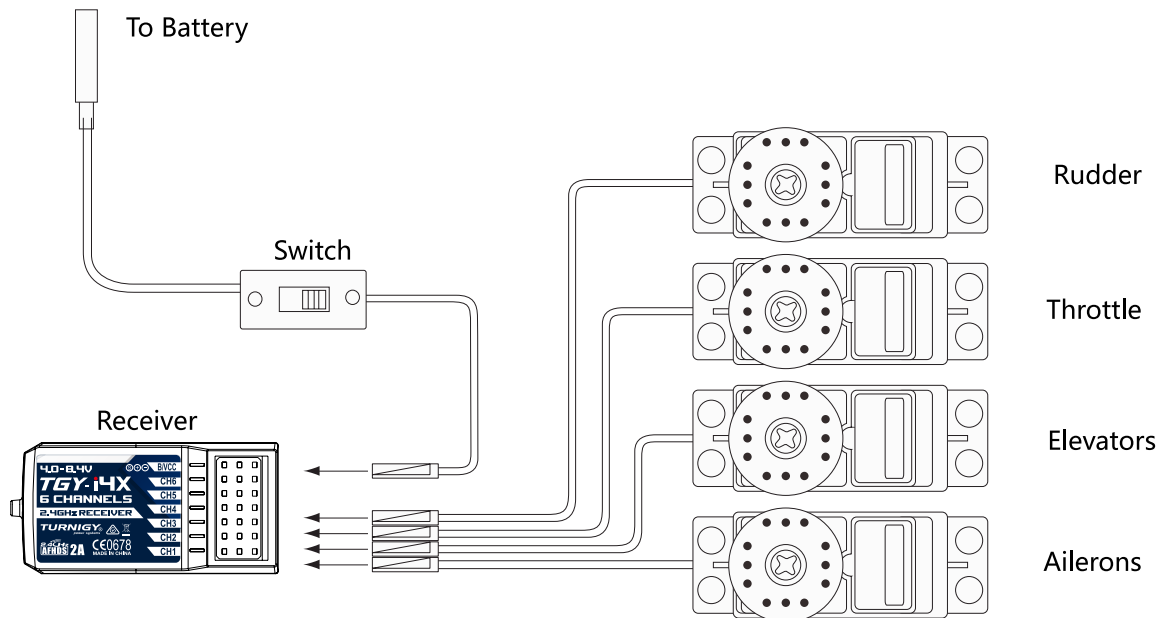
- Off: the power is not connected.
- Lit in red: the receiver is on and working.
- Flashing quickly: the receiver is binding.
- Flashing slowly: the bound transmitter is off or signal is lost.



### 2.3.3 Connectors

The connectors are used to connect the parts of model and the receiver.

- CH1 to CH6: used to connect the servos, power or other parts.
- BAT: used to connect the bind cable for binding, and the power cable during normal operation.



## 3. Getting Started

Before operation, install the battery and connect the system as instructed below.

### 3.1 Transmitter Battery Installation



**Danger** • Only use specified battery.



**Danger** • Do not open, disassemble, or attempt to repair the battery.



**Danger** • Do not crush/puncture the battery, or short the external contacts.



**Danger** • Do not expose to excessive heat or liquids.



**Danger** • Do not drop the battery or expose to strong shocks or vibrations.



**Danger** • Always store the battery in a cool, dry place.



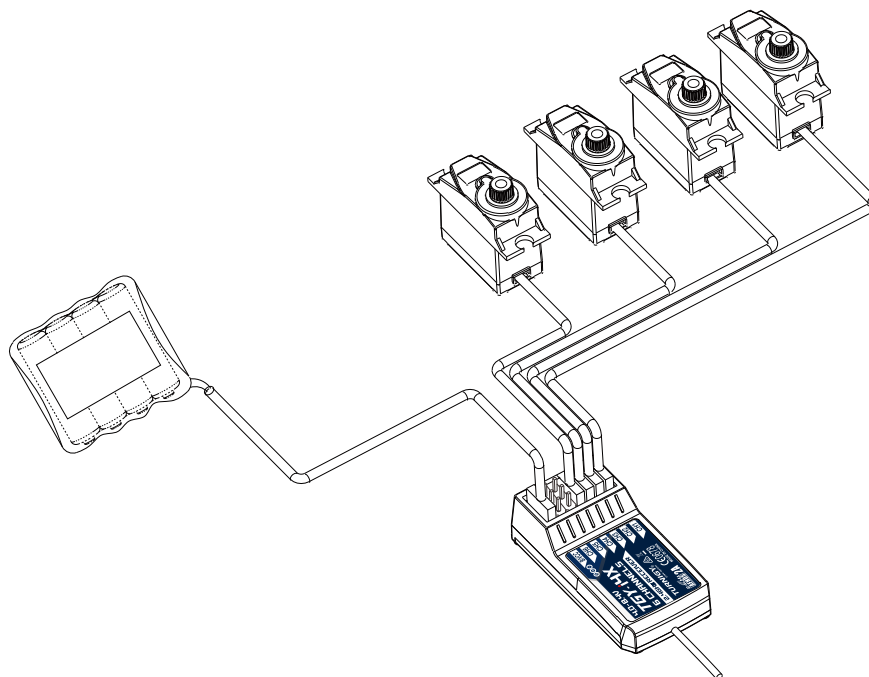
**Danger** • Do not use the battery if damaged.

Follow the steps to install the transmitter battery:

1. Open the battery compartment.
2. Insert 4 fully-charged AA batteries into the compartment. Make sure that the batteries makes good contact with the battery compartment's contacts with the correct polarity.
3. Replace the battery compartment cover.

### 3.2 Connecting the Receiver and Servos

Connect the receiver and the servos as indicated below:



## 4. Operation Instructions

After setting up, follow the instructions below to operate the system.

### 4.1 Power On

Follow the steps below to turn on the system:

1. Check the system and make sure that:
  - The batteries are fully charged and installed properly.
  - The receiver is off and correctly installed.
2. Toggle the power switch to its upward position.
3. Connect the receiver power supply to the **BAT** port on the receiver.

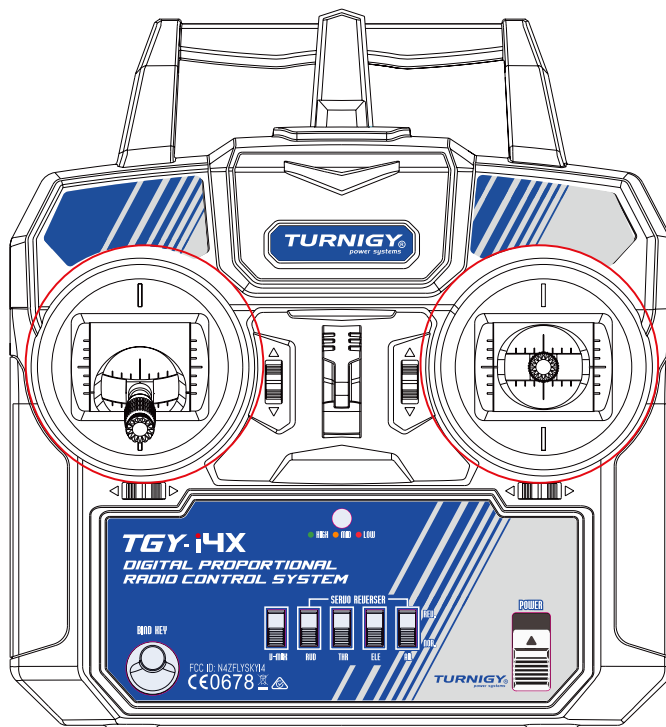
The system is now powered on.

### 4.2 Switching Between AFHDS 2A and AFHDS

To switch between AFHDS 2A and AFHDS , hold both stick at the bottom left corner and turn on the transmitters power at the same time. Wait for 1 second then turn the power off again to save the new setting.

AFHDS : The LED will light up for one second.

AFHDS 2A : The LED will light up for one second followed by a sound.



### 4.3 Binding

The transmitter and receiver have been pre-bound before delivery. If you are using another transmitter or receiver, follow the steps below to bind the transmitter and receiver:

1. Connect the supplied bind cable to the **BAT** port on the receiver.
2. Insert power into any other port.
3. Hold the bind key while powering on the transmitter to enter bind mode.
  - When the receiver and transmitter have bound the red LED will stop flashing.
4. Remove the power and bind cable from the receiver. Then connect the power cable to the **BAT** port.
5. Turn on the transmitter.
6. Check the servos' operation. If anything does not work as expected, restart this procedure from the beginning.

### 4.4 Pre-use Check

Before operation, perform the following steps to check the system:

1. Check to make sure that all servos and motors are working as expected.
2. Check operating distance: one operator holds the transmitter, and another one moves the model away from the transmitter. Check the model and mark the distance from where the model starts to lose control.



**Danger**

- Stop operation if any abnormal activity is observed.



**Danger**

- Make sure the model does not go out of range.

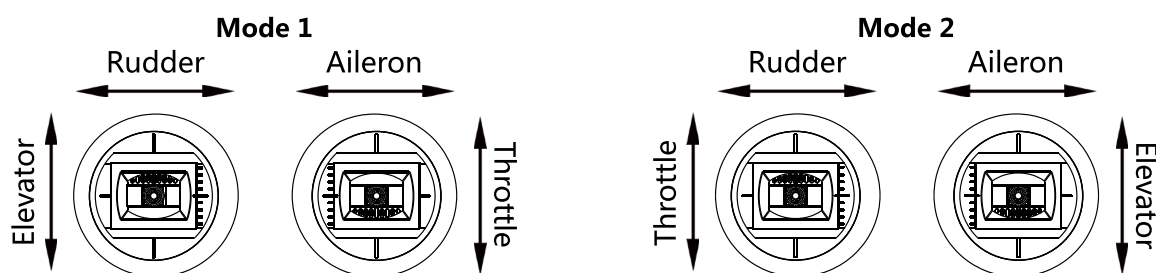


**Attention**

- Sources of interference may affect signal quality.

### 4.5 Changing Stick Modes

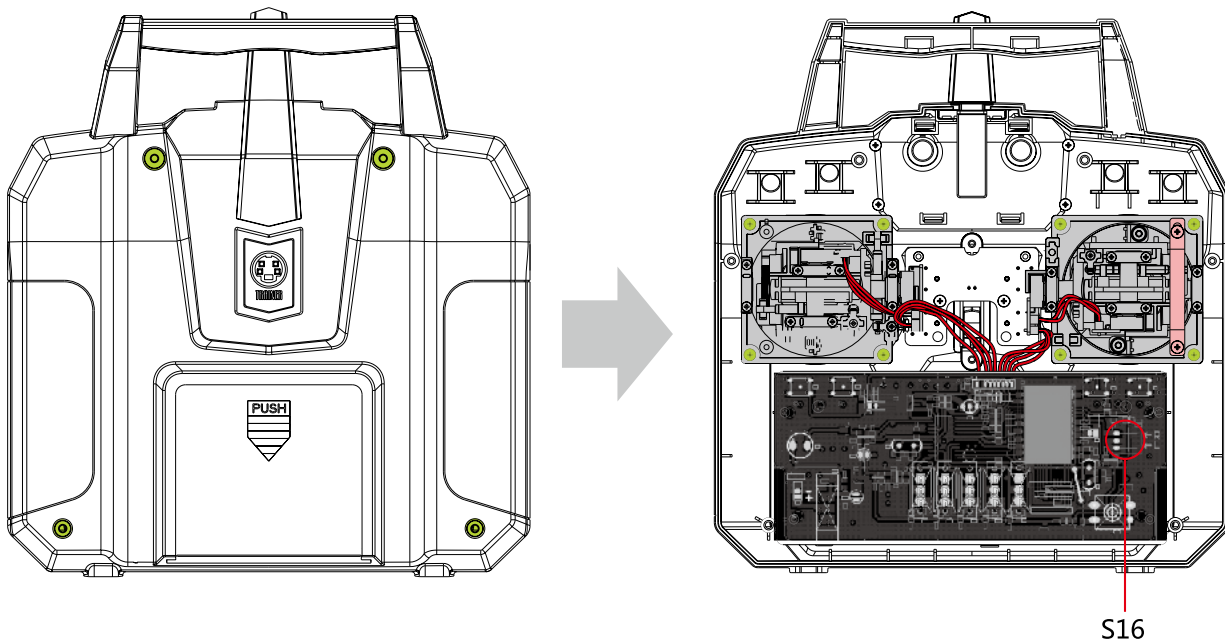
There are two sticks on the transmitter and two preset modes for the functions of the sticks. The functions of the sticks in respective modes are shown below:



You can switch the stick modes to suit your operation habit. To switch the sticks:

1. Take the battery out from the transmitter. Loosen the four screws that hold the rear cover shown in green on page 12.
2. Carefully take the back off the transmitter and disconnect the cables connected to it.
3. Unscrew the screws around the gimbals, marked in green in the picture on page 12.

4. Switch the gimbals to the opposite side. Make sure the gimbals have been rotated 180 degrees so that the wires are facing towards the middle of the system.
5. Move hat of the S16 connector so that one side is on the L or R pin, L for when the self centring stick is on the left side and R for when its on the right.



6. Reconnect the back's cables, reattach the back and tighten the screws.

## 4.6 Power Off

Follow the steps below to turn off the system:

1. Disconnect the receiver power.
2. Toggle the transmitter's power switch to its low position.



**Danger**

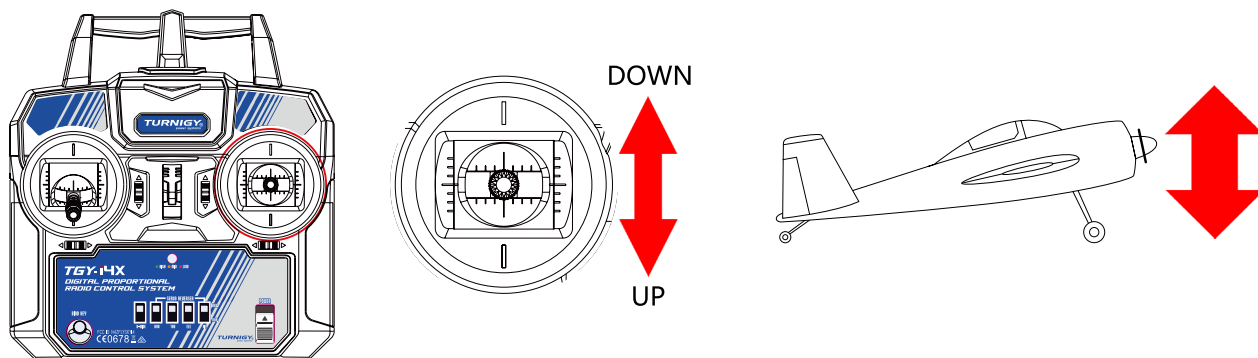
- **Make sure to disconnect the receiver power before turning off the transmitter. Failure to do so may lead to damage or serious injury.**

## 5. Function Descriptions

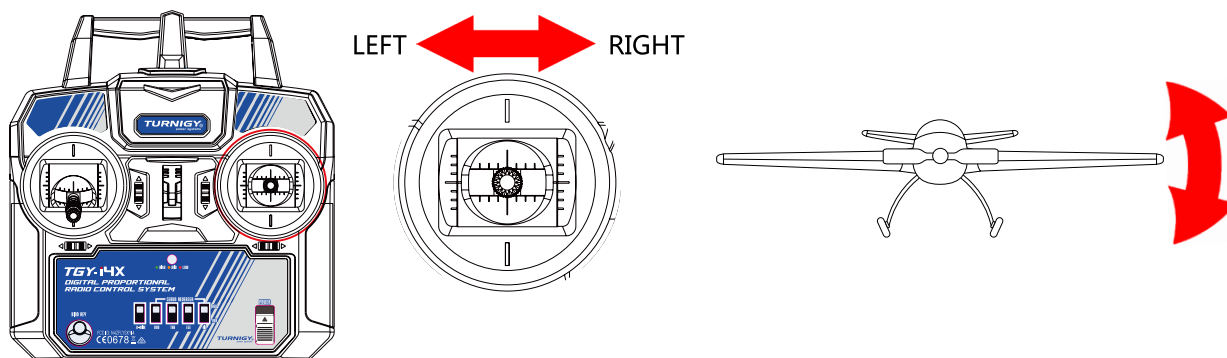
### 5.1 Flight Controls (Default Mode 2)

The sticks are used for controlling the aircraft, each stick has 2 functions. The right stick controls pitch and roll, the left stick controls throttle and yaw.

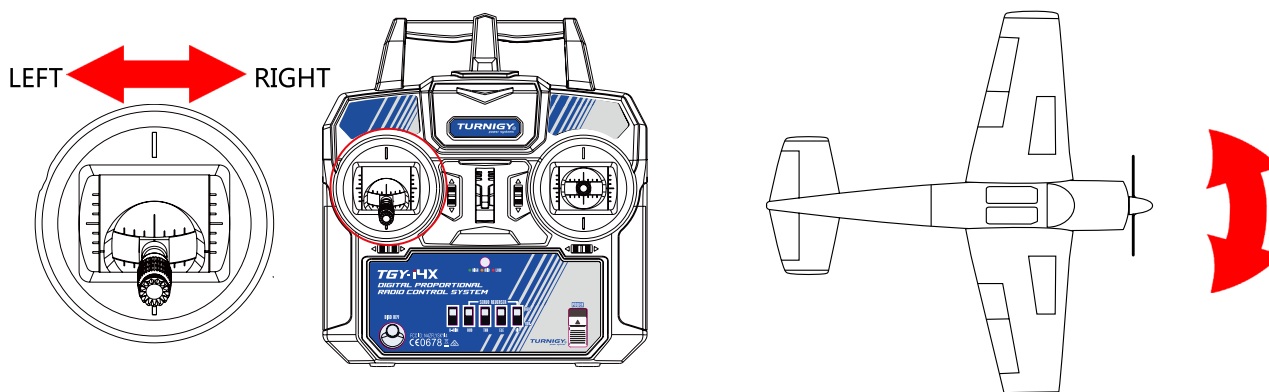
#### Pitch (Right Stick Up/Down)



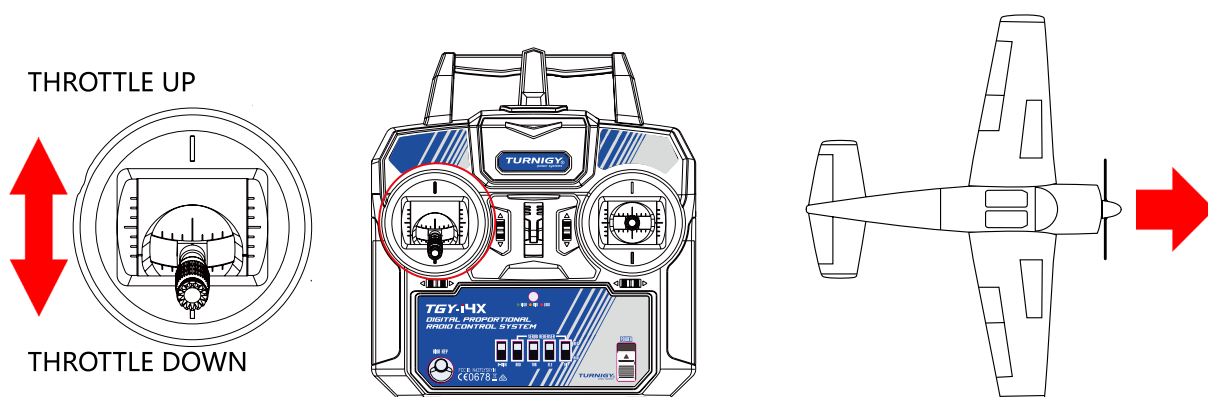
#### Roll (Right Stick Left/Right)



#### Yaw (Right Stick Left/Right)



## Throttle (Right Stick Up/Down)



## 5.2 Reverse Function

Channels 1-4 can be reversed, to reverse a channel:

- 1. Test the servo/throttle to make sure that the action corresponds as expected with the transmitters controls.
- 2. If the direction of travel is wrong then toggle corresponding switch located at the bottom of the transmitter, labeled as AIL (Aileron), THR (Throttle), ELE (Elevator), RUD (Rudder). Up position being reverse and down position being normal.
- 3. Test the servos again to make sure the direction of travel is correct.



## 5.3 V-MIX

The V-MIX function is used for models that have no rudder.

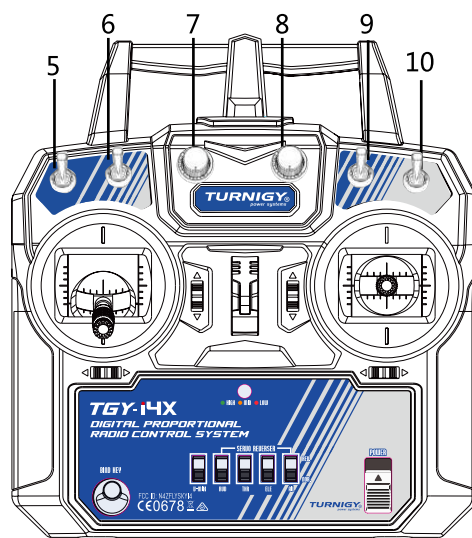
No rudder: Creates a mix between channels 1 and 2, ailerons and elevators.



## 6. System Customization

The TGY-i4X's switches and knobs can be moved to other channels. Or if using receivers with more channels, the system can be expanded with extra switches or knobs.

By default, from left to right, the switches and knobs are channels 5, 6, 7, 8, 9 and 10.



### 6.1 Switching Channel Assignments

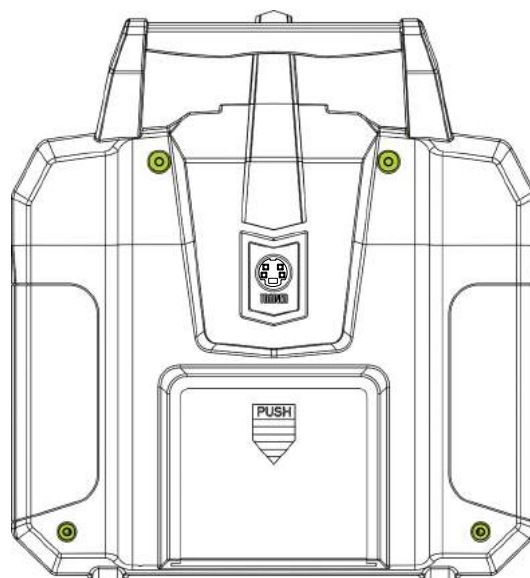
To change a switch or knobs channel, the system must be taken apart. The first step is taking the back cover off.

1. Remove any batteries from the system and replace the battery cover.
2. Remove the screws marked in green.

**⚠ Attention** • **Make sure the screw driver you are using is not too big or too small. Failure to do so could damage the head of the screw.**

3. Carefully pry the front and back apart, this may take some force.

**⚠ Attention** • **Don't pull the pieces too far apart, doing so could damage cables attaching the front and back together.**

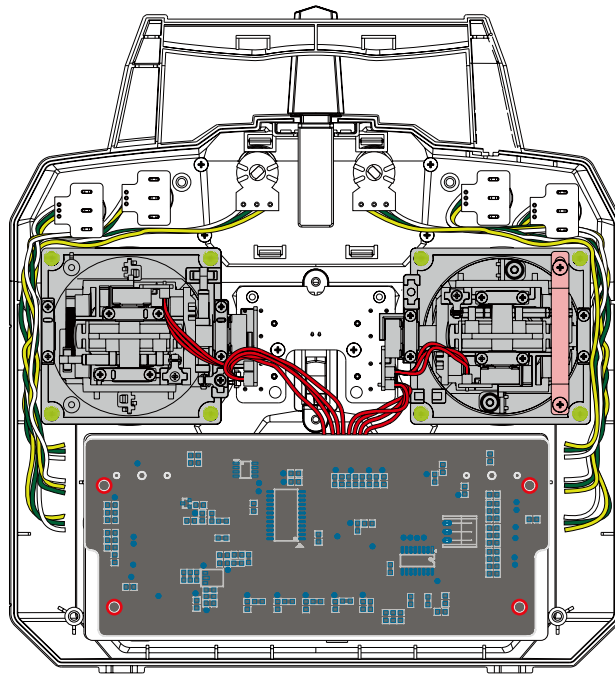


4. Carefully disconnect the cables connecting the front to the back.
5. Carefully remove the screws marked below in red.

**⚠ Attention** • **Make sure you keep the screws in a safe place.**

6. Remove the power button cover from the front side of the system. To do so simply put the end of a screw driver under and gently lift it off.





7. Carefully pull the circuit board out and towards you.

**⚠ Attention** • Remember that there are wires on the other side of the board. To avoid damage do not pull or put any tension on the wires.

**⚠ Attention** • Make sure that the wires are fitted along beside each of the gimbals as show above.

**⚠ Attention** • Make sure that all switches are installed with the correct orientation shown above.

8. The connectors for channels 5 - 10 are marked in red on the diagram . On the circuit board each channel is labled, making it easy to find the correct channel. Follow the cables leading from each connector to identify which switch or knob goes to each channel.

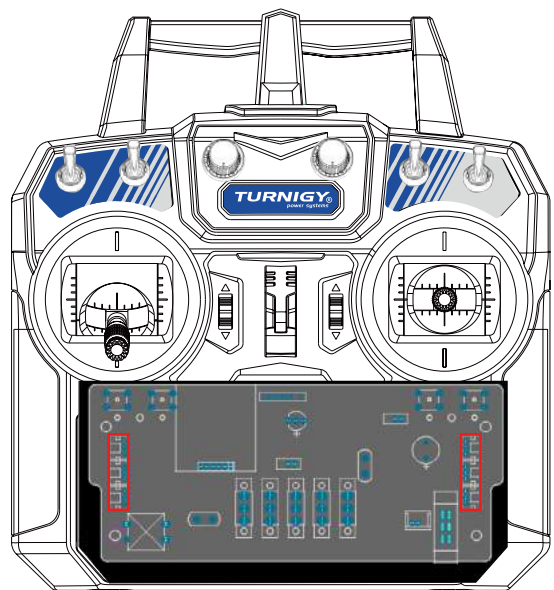
9. Carefully remove the desired connectors from the board.

**⚠ Attention** • Do not pull on the wires themselves, doing so may damage the connector or wire.

10. Replace the desired switch/knob connectors into the corresponding channel slot;

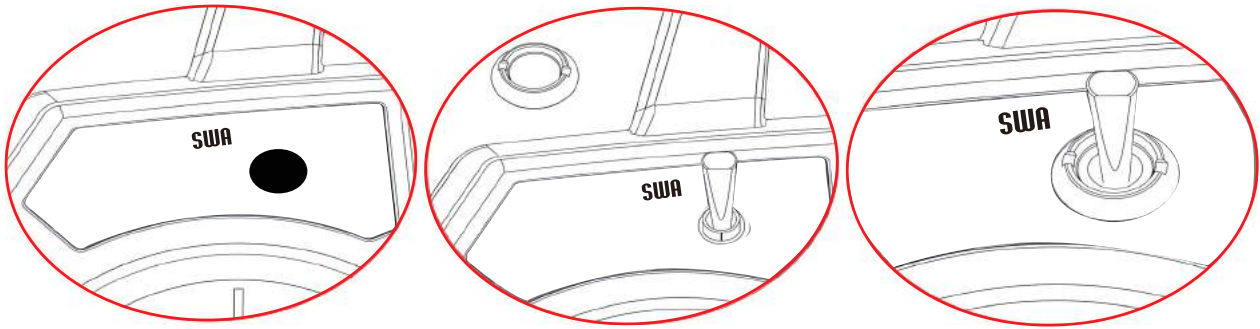
11. Put the circuit board back in place and replace the screws;

**⚠ Attention** • Make sure that you don't over tighten the screws, this could lead to damage of the system or the screws.



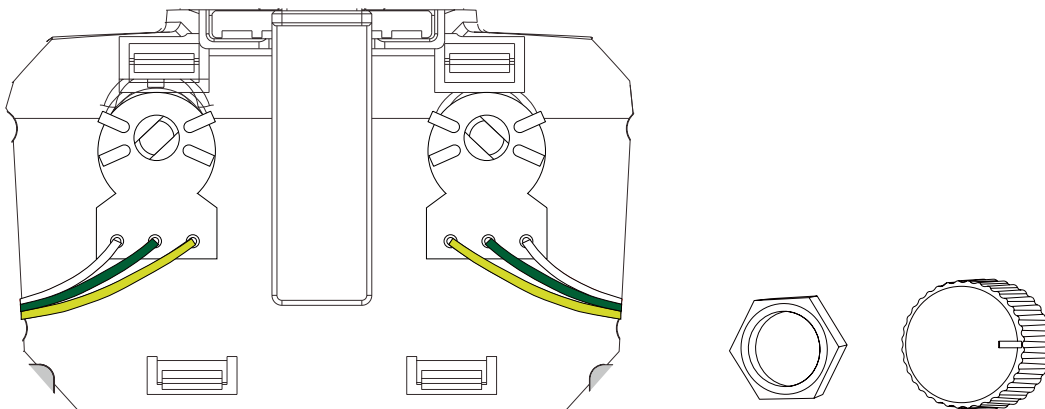
To change a toggle:

- a. Disconnect the switches wire from the connector on the board;
- b. Use a flathead screw driver to turn the switches locknut counter-clockwise until it can be removed, then remove the switch;
- c. Insert the new switch through the hole making sure it is orientated to the same direction as the other switches. Replace the lock nut and tighten by hand or using a flathead screwdriver;
- d. Insert the new switches wire into the connector on the board.



Adding a knob:



- a. Remove the plastic top of the knob by firmly pulling up, then unscrew the hexagon nut;
- b. Put the top of the knob through the hole in the front cover of the system. Then attach and tighten the nut again and place the cover back in place;
- c. Connect the knobs wire to the connector on the board.

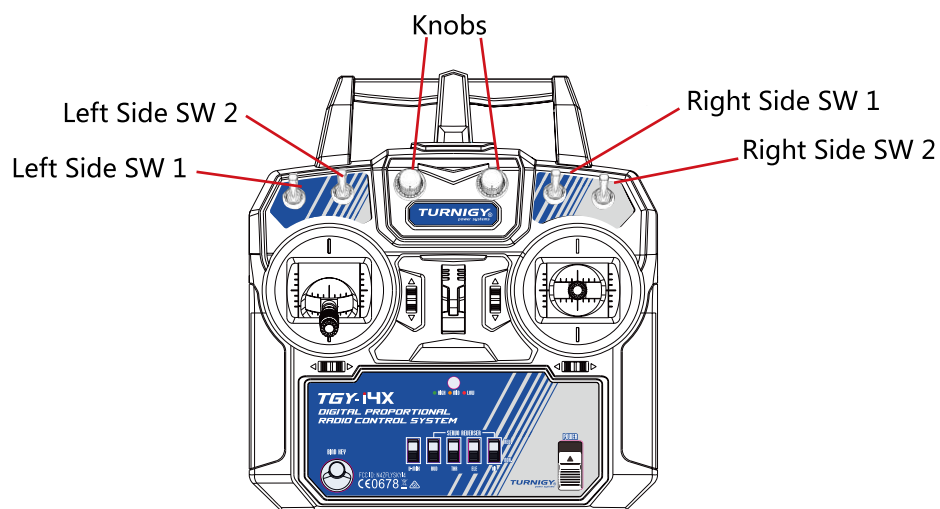


12. Put the back cover back in place, and squeeze the handle until the two pieces click together;
13. Replace the cover screws;
14. Replace the power button cover.


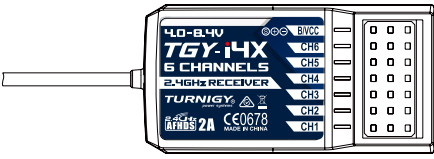
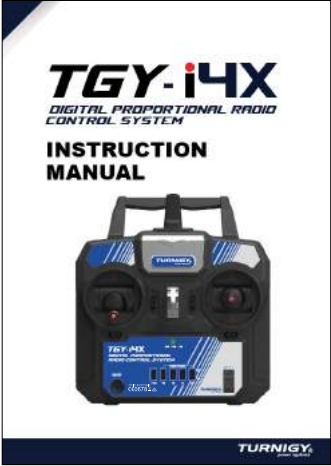
## 7. Customization Selection Sheet

| Addition            | Option 1                           | Option 2   | Option 3   | Option 4                      |
|---------------------|------------------------------------|--|--|-------------------------------|
| Left Side Switch 1  | No Switch <input type="checkbox"/> | 2 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> | 3 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> |                               |
| Left Side Switch 2  | No Switch <input type="checkbox"/> | 2 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> | 3 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> |                               |
| Right Side Switch 1 | No Switch <input type="checkbox"/> | 2 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> | 3 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> |                               |
| Right Side Switch 2 | No Switch <input type="checkbox"/> | 2 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> | 3 Way Switch <input type="checkbox"/><br>Long <input type="radio"/><br>Short <input type="radio"/> |                               |
| Central Knobs       | No <input type="checkbox"/>        | Yes <input type="checkbox"/>   |  | Knob <input type="checkbox"/> |

|   |  |
|---|--|
|   | Black <input type="checkbox"/><br>White <input type="checkbox"/><br>Silver Plating <input type="checkbox"/><br>Silver Injection <input type="checkbox"/> |
|  | Black <input type="checkbox"/><br>White <input type="checkbox"/><br>Silver Plating <input type="checkbox"/><br>Silver Injection <input type="checkbox"/> |



## 8.Package Contents

|   |   |
|---|---|
| 4-10 Channel 2.4GHz Transmitter (TGY-i4X) |  |
| 2.4GHz Receiver TGY-i4X (6 CH)            |   |
| User Manual                               |  |

## 9. Product Specification

### 9.1 Transmitter Specification (TGY-i4X)

|                                |                                |
|--------------------------------|--------------------------------|
| Channels                       | 4 - 10 (Default 4)             |
| Model type                     | Fixed-Wing/Glider/Helicopter   |
| RF range                       | 2.408-2.475GHz                 |
| Bandwidth                      | 500 KHz                        |
| RF channel                     | 135                            |
| RF power                       | Less than 20 dBm               |
| 2.4GHz system                  | AFHDS 2A and AFHDS             |
| Modulation type                | GFSK                           |
| Stick resolution               | 1024                           |
| Low voltage alarm              | Yes (lower than 4.2V)          |
| DSC port                       | Yes (PS/2 PPM)                 |
| Power input                    | 6V DC 1.5AA*4                  |
| Antenna length                 | 26 mm                          |
| Weight                         | 323g                           |
| Size (Length x Width x Height) | 174 x 89 x 190mm               |
| Color                          | Black                          |
| Certificate                    | CE0678, FCC ID:N4ZFLYSKYI4,RCM |

### 9.2 Receiver Specification (TGY-i4X)

|                                |                              |
|--------------------------------|------------------------------|
| Channels                       | 6                            |
| Model type                     | Fixed-Wing/Glider/Helicopter |
| RF range                       | 2.408-2.475 GHz              |
| RF channel                     | 135                          |
| 2.4GHz system                  | AFHDS 2A                     |
| Modulation type                | GFSK                         |
| Power input                    | 4.0 to 6.5 V DC              |
| Weight                         | 13 g                         |
| Antenna length                 | 26 mm                        |
| Size (Length x Width x Height) | 45 x 23 x 9 mm               |
| Color                          | Grey (Transparent)           |
| Certificate                    | CE0678, FCC,RCM              |
| RX sensitivity                 | -105dBm                      |
| i-Bus port                     | No                           |
| Data acquisition port          | No                           |

## Appendix 1 FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example use only shielded interface cables when connecting to computer or peripheral devices).

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

### Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.



***TURNIGY***®  
*power systems*



FC C E 0678



MADE IN CHINA