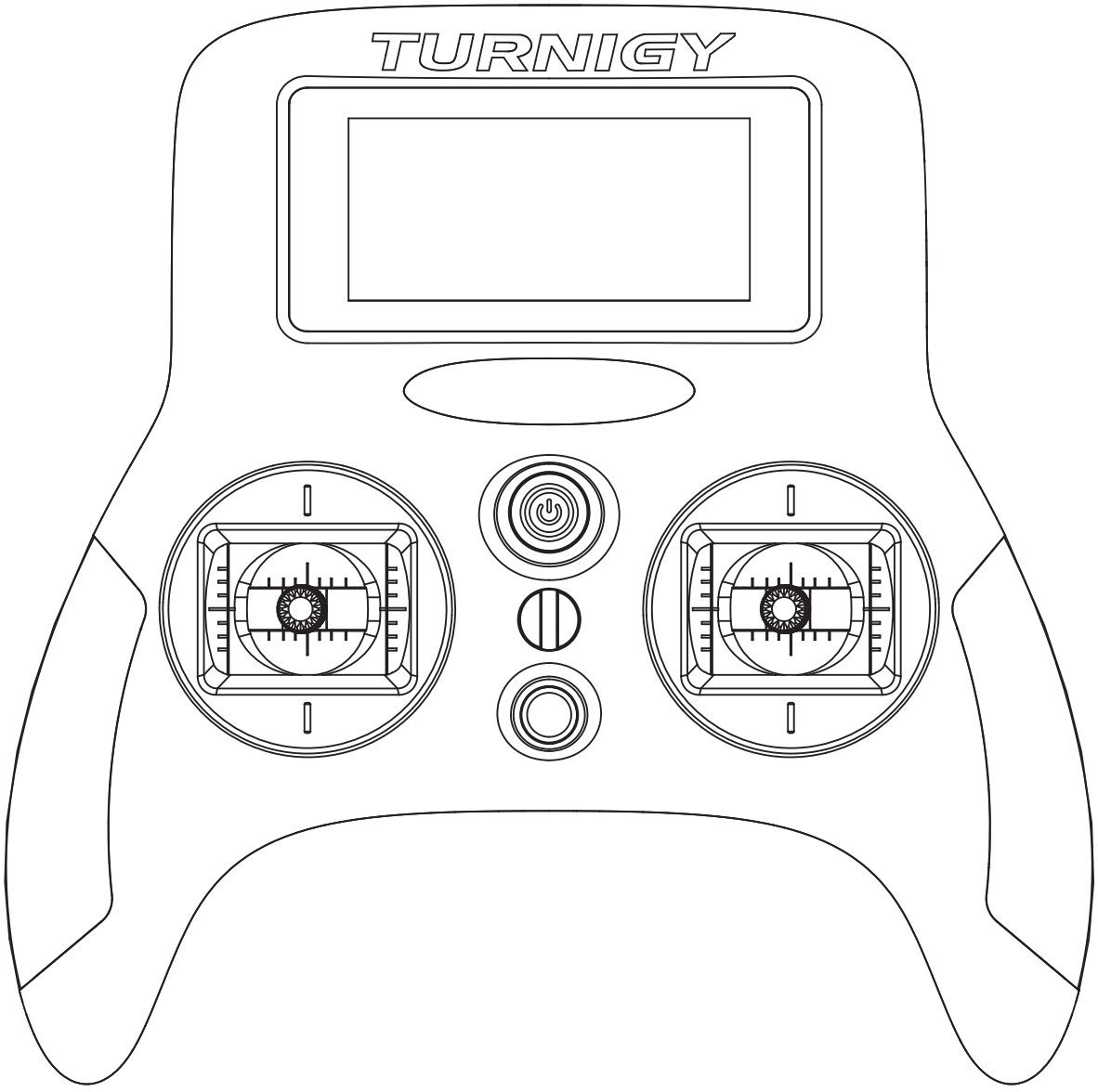
Evolution PRO

Digital Proportional Radio Control System

INSTRUCTION MANUAL



Model No.:HK-MT6B

TURNIGY® power systems

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

Read this manual carefully before operating 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

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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

- **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 rainy or snowy 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 antennae
  - 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 would cause loss of control.**

2. Introduction

The Evolution Pro transmitter and TGY-iA6C receiver constitutes a 2.4GHz AFHDS 2A digital proportional computerized R/C system. This system supports fixed-wings, helicopters, multi-rotors.

2.1 System Features

The AFHDS 2A (Automatic Frequency Hopping Digital System Second Generation) is specially developed for all radio control models. It offers superior protection against interference while maintaining lower power consumption and high reliable receiver sensitivity, the 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 / S-BUS support.

Multi-channel Hopping Frequency

This system's bandwidth ranges from 2.408GHz to 2.475GHz. This band is divided in 135 channels. 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.

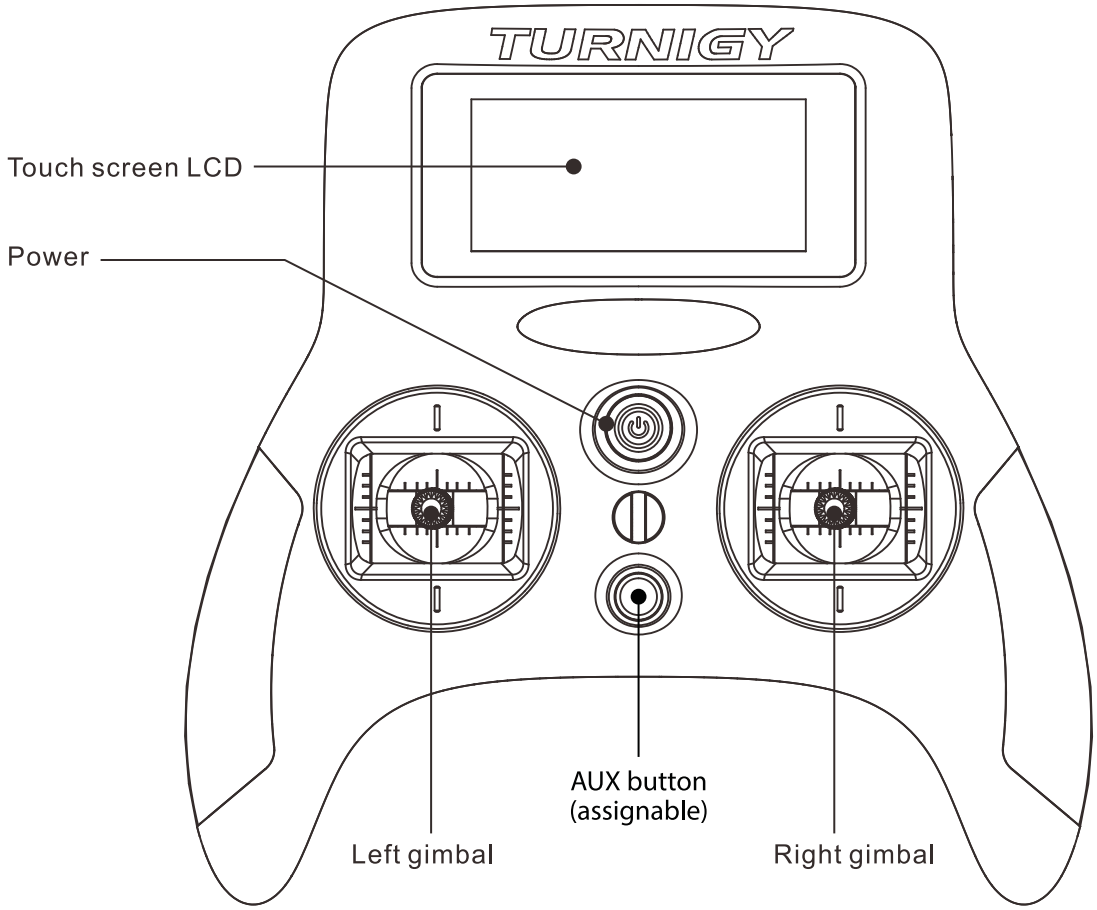
Unique ID Recognition System

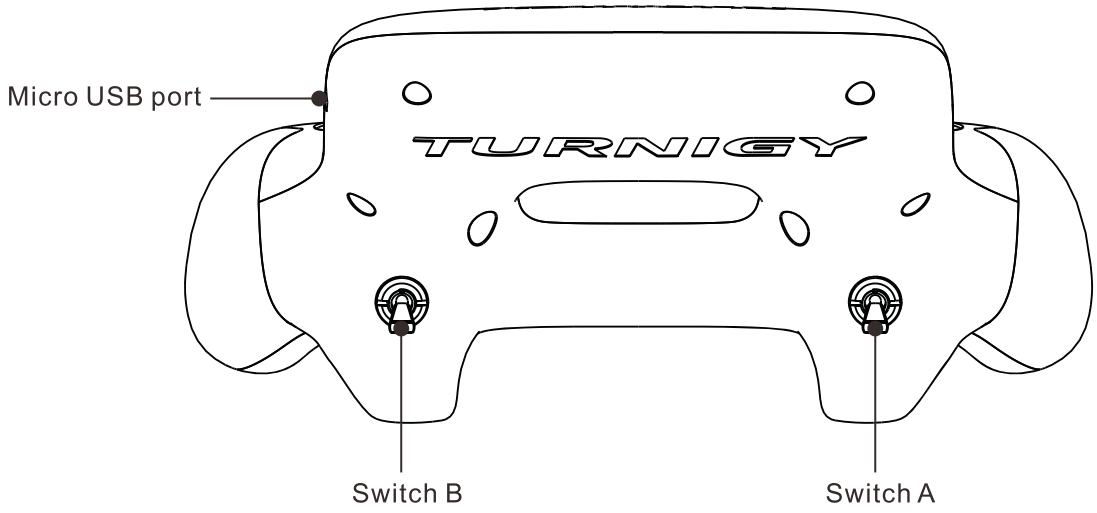
Each transmitter and receiver has its own unique ID. Once the transmitter and receiver have been paired, they will only communicate with each other, preventing other systems accidentally connecting to or interfering with the system's operation.

Low Power Consumption

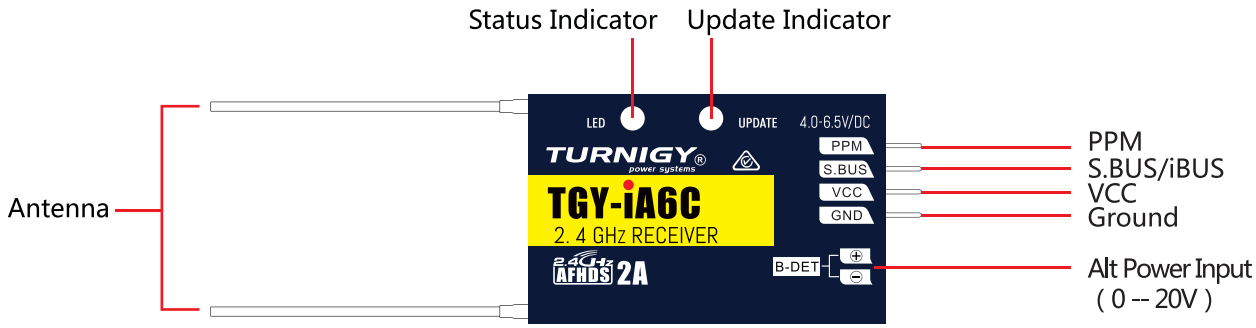
The system is built using highly sensitive and low power consumption components, maintaining superior receiver sensitivity, while consuming as little as one tenth the power of a standard FM system, thus dramatically extending battery life.

2.2 Transmitter Overview





2.3 Receiver Overview



2.3.1 Receiver Antenna

Attention

- **Place antennae perpendicular to each other in aircraft to increase a chance to receive a signal in any model orientation**
- **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.

- PPM: Channel output
- GND/VCC: Power Input
- S.BUS: S.BUS and i.Bus Interface
- B-DET: Alternative port for powering receiver.

2.4 USB Simulator Mode

The system may be used as a HID controller when connected to a computer via mirco USB cable. When connected to a computer the function is activated automatically and will be recognized by windows as a game controller.

To calibrate or test the system in windows:

- 1. Type "RUN" into the search bar and select the program.
- 2. Type "joy.exe" into the "Open:" box and press enter.
- 3. Select the system and open properties within the game controller menu.

Note:

- **any changes made to trims within the system will take effect in the USB mode. If the system is not responding as expected, reset to factory settings in the system menu.**

3. Getting Started

3.1 Transmitter Battery

The transmitter uses internal batteries. To charge, connect the system to a suitable USB charger or computer .

⚠ **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.**

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. (Charge the system via mirco USB cable)
   - The receiver is off and correctly installed.
2. Hold the power buttons until screen lights up.
3. Connect the receiver power supply to the **VCC** and **GND** port on the receiver.

The system is now powered on. Operate with caution, or serious injury could result.

4.2 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. Turn the transmitter on, press  , and scroll down and then select [**RX bind**].
2. On the receiver, connect the power cable to the VCC and GND. When the receiver is powered on it will remain in binding mode for 3 seconds. The system should now bind, once the LED on the transmitter has stopped flashing the process is complete.

4.3 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.**

4.4 Power Off

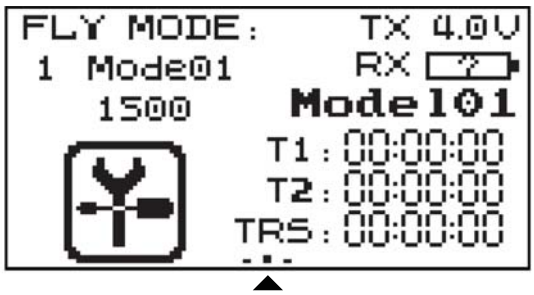
Follow the steps below to turn off the system:

1. Disconnect the receiver power.
2. Hold the transmitter's power buttons to turn off the transmitter.

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. Home Screen

The home screen displays useful information about your model, including timers and TX/RX status.



Main Menu

TX/RX Battery Status + Battery Setup Menu

Timers + Timer Menu

Screen slider indicator

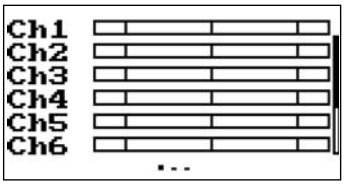
you can slide the screen to the left and to the right.

The system's navigation is designed to be easy and quick.

- To change home screen page, use your finger to swipe from left to right to view the **Channels** screen and **Telemetry** screen respectively.
- To enter the main menu, press the icon. Then use your finger to swipe up or down on the screen to scroll.
- To enter a function, tap on its name.
- To navigate function menu, swipe up or down to scroll and press an item on the list to enter it.
- To go back to a previous menu, press the icon.

- **Channels (a. k. a. Display Servos) screen**

  Slide the screen to the right to find the **Display Servos** screen shown below.

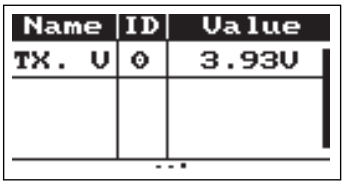


Press and hold the screen to perform a servo test.

Note: Make sure that the motors are turned off/disconnected during test. Failure to do so could lead to harm to yourself or others.

- **Telemetry screen**

  Slide the screen to the left to find the **Telemetry** screen shown below.



5.1 Timers

To enter the timer function touch T1/T2 on the main screen. The system has 2 timers available, both can be assigned to a switch and have 3 different settings.

Setup:

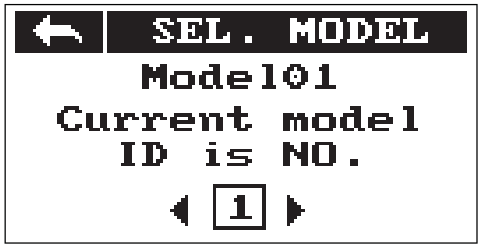
1. Select a mode.
   Modes:
   - Up: The up timer starts from zero and counts up.
   - Down: The down timer starts from a pre selected time and counts down.
   - D/U(Down then up): The D/U timer starts from the set time, and counts down to 0, then counts back up.
2. If neccessary set up the pre defined time by selecting the "Setup" option Select the correct decimal and use the on-screen arrow keys to change the value.

6. Function Settings

6.1 Select Model

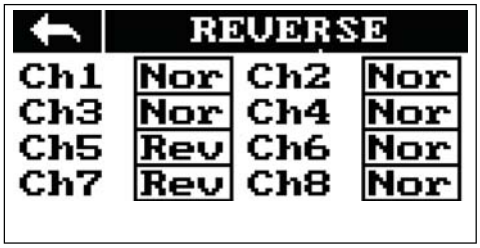
The system stores up to 20 different model presets which can be recalled, quickly and easily.
To select a model:

1. Touch the model number displayed in a black box.
2. The system will now display the ID menu, use the on-screen up and down arrow keys to navigate to the desired model.
3. Press the ✓ to confirm or ✕ to cancel.



6.2 Reverse

The reverse function changes a channel's direction of movement in relation to its input.

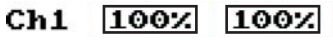


Setup:
To change between normal and reverse touch the box to the right side of the desired channel.
Nor = Normal, Rev = Reverse.

Select the  icon to save and return to the previous meun.

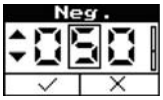
6.3 End Points

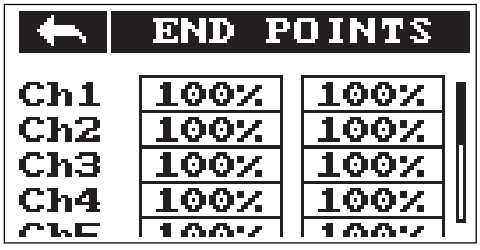
The end point function changes the range of movement available to a channel.
The left box is the low end point, the right box is the high end point.



To change an end point:

1. Touch the low or high end point box.
2. Touch the desired decimal to change then use the on-screen up and down arrows to change the value.





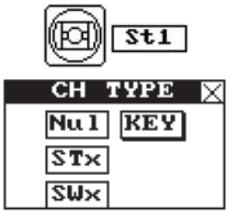
3. Press the ✓ or ✕ to confirm or cancel changes.
4. Select the  icon to save and return to the previous menu.

6.4 Aux. Channels

The auxiliary channels can be used to control additional part of a model such as landing gear or lights.

1. Select channels using the left or right arrow keys on the screen on either side of the channel name.

2. The left box below the channel name allows the user to pick the type of control for that channel, Nul, Stx and SWx.



3. Select the icon to save and return to the previous menu.

6.5 Subtrim

Subtrim changes the center point of the channel. For example, if a model is always drifting to one side, the sub trim can be used to fix this.

To set the subtrim function:

To change the subtrim:

1. Touch the box to the right of the desired channel.

2. Select the correct decimal and use the up and down arrow keys.

3. Press the ✓ or ✗ to confirm or cancel changes.
4. Select the icon to save and return to the previous menu.

6.6 Failsafe

The failsafe function enables you to pre-set channel positions for the receiver in case of signal loss.

Setup:

1. To setup a failsafe position on a channel, select the channel from the list, to select the channel touch the box to the right of the channel name.
2. The box next to the channel name should display "On", to activate the failsafe touch the box. The box should now display "Off".
3. Move and hold the channel at the desired position, then while keeping the channel at the desired value touch the setup box.

Set all:

It is possible to set all the channels at the same time, to do so first turn all the channels on as stated above, hold all the channels in the desired position and select "Set all" at the bottom of the list. The system will prompt for a confirmation, select "Y" for yes.

To Reset all channels, select the "Reset all" option.

Select the icon to save and return to the previous menu.

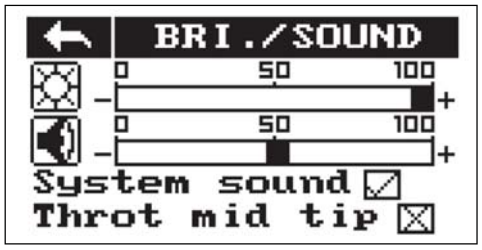
6.7 RX Bind <Please refer to section **4.2 Binding**>

This package´s transmitter and receiver have been pre-bound before delivery.
RX Bind is only useful when you want to use another receiver.

6.8 Bri./Sound (Brightness / Sound)

This function controls screen brightness and volume for the system.

To make changes to brightness or volume touch and drag the black box located within the relevant slider. Then select the icon to save and return to the previous menu.



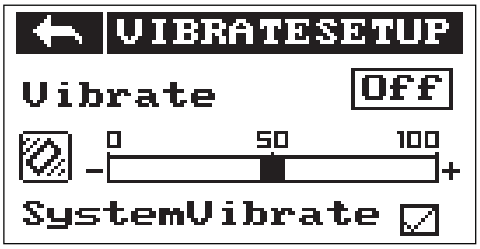
6.9 LED Setup

This function controls the LEDs inside the gimbal. When Idle color mode is off, the system will change colour depending on vertical stick position. When Idle color mode is active the system will maintain a single colour, touch the RGB sliders to change the color.

Then select the icon to save and return to the previous menu, select 'Y' when prompted.

6.10 Vibrate Setup

This function allows you to adjust the vibration strength, and set vibration to on or off status.



6.11 Range Test

In this menu user can check the operating range of the receiver and transmitter.
Always perform range test before flights.

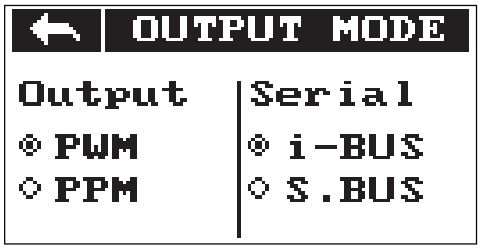
- Put your model (with receiver) about 30 paces away from the radio.
- Press on “Normal” icon on screen. The icon will change to “Reduced”and starts beeping, indicating that the radio is in range test mode and outputs reduced power (approximately 40 times less than normal power).
- Move sticks and verify that all control surfaces on the model respond correctly according to sticks move.

When range test is done, press the “Reduced” icon to bring power back to normal (“Normal” icon will be displayed) and then exit the menu. You can also verify signal strength RSSI level of the receiver in this menu.

6.12 Output Mode

The system has four output modes, PWM, PPM, i-BUS and S-BUS.

To change between the modes touch the desired mode, the currently selected mode will have a black dot within the circle beside it.

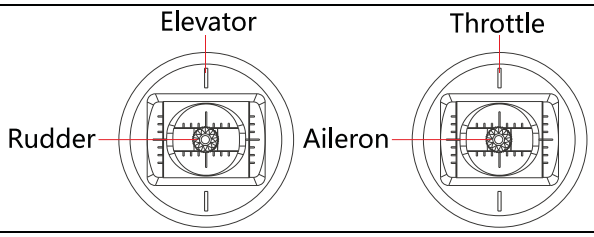


Select the  icon to save and return to the previous menu.

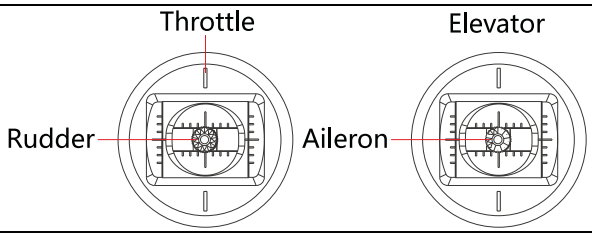
6.13 Stick Mode

The system has 4 stick modes to change from, to change the mode touch M1, 2, 3 or 4 on the right hand side of the screen. The currently selected mode is highlighted in black.

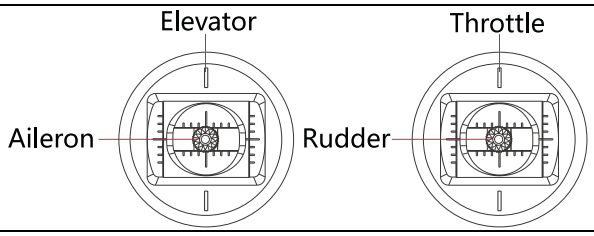
Mode 1



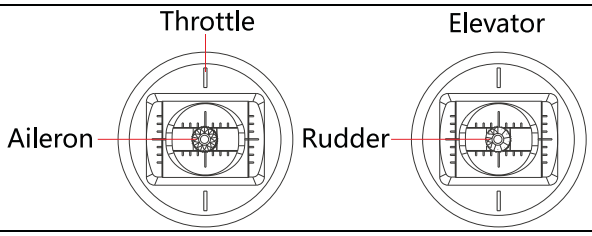
Mode 2



Mode 3



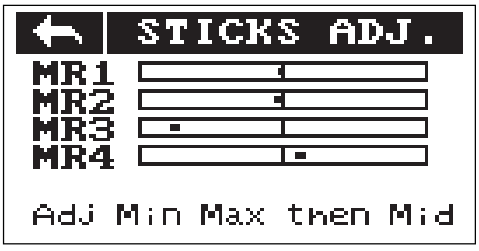
Mode 4



6.14 Sticks Adjust

This screen allows you to calibrate the sticks.

After entering this function, you can only exit until the calibration of the sticks is complete,

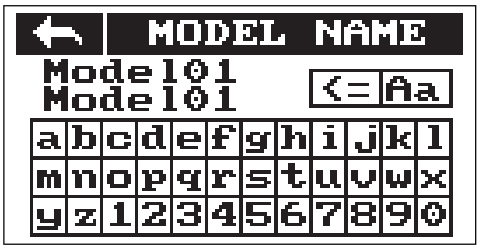


To calibrate, move both sticks all the way up and down, then left and right to their limit.

Once the calibration is complete make sure all the sticks are at their center position before touching the back arrow on the top left of the screen.

6.15 Model Name

You can assign or change your model name (for your currently selected model) here.



To change other model's name, go to **Select Model** screen to select the model, them return to this **Model name** screen to change the name.

6.16 Model Reset

To reset the current model, select “Model reset” from the main menu.
Press “Y” for yes. Press “N” to cancel.

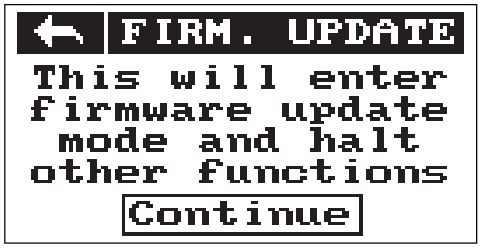
6.17 Factory Reset

This function resets all settings back to default. To reset the system, select “Factory reset” from the main menu. Press “Y” for yes. Press “N” to cancel.

6.18 Firmware Update

To update the system's firmware:

1. Download the latest firmware updating program from www.Hobbyking.com.
2. Connect the system to your PC using a mirco USB cable.
3. Select “Firmware update” from they system's function menu. The system will show a prompt, “This will enter firmware update mode and halt other functions” with a “Continue” button. Press“Continue” button to confirm firmware update.



Remark: During update the system’s screen will freeze (with back light off) until the update process is done.

4. Run the firmware updating program on your PC.
5. Once the system has been recognised by the computer select the update button at the bottom of the firmware update software.

Once the system has been updated it will restart. Once the system has restarted it is safe to remove the USB cable.

6.19 About Evolution

This menu shows the product name, firmware version, firmware release date.

7. Product Specification

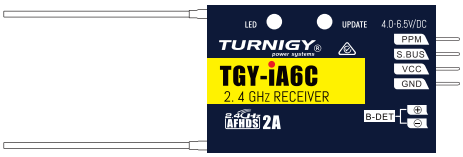
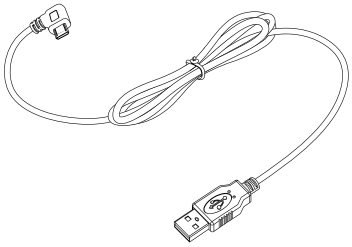
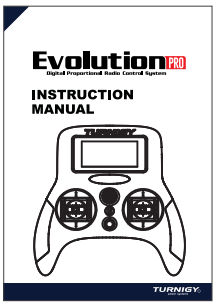
7.1 Transmitter Specification (Evolution PRO)

Channels	8
Model type	Fixed-wing/Helicopter/Multi-rotor
RF range	2.408 ~ 2.475 GHz
Bandwidth	500 KHz
RF channel	135
RF power	Less than 20 dBm
2.4GHz system	AFHDS 2A
Modulation type	GFSK
Stick resolution	4096
Low voltage alarm	Yes (lower than 3.7V)
USB Port	Micro USB
Power input	4.2V
Antenna length	26 mm*2
Size (Length x Width x Height)	190x170x85mm
Color	White/Black
Certificate	CE, FCC ID : N4ZMT6B00 , RCM

7.2 Receiver Specification (TGY-iA6C)

Channels	8 (serial), 6 (PWM)
Model type	Fixed-wing/Helicopter/Multi-rotor
RF range	2.408 ~ 2.475 GHz
RF channel	135
RX sensitivity	-105dBm
2.4GHz system	AFHDS 2A
Modulation type	GFSK
Power input	4.0V - 6.5 V DC
Weight	7.9 g
Antenna length	26 mm*2
Size (Length x Width x Height)	37.5mm x 24.2mm x 9.0 mm
Color	Black
Certificate	CE, FCC ID : N4ZIA6C00 , RCM
i-Bus port	Yes
Data acquisition port	Yes

8. Package Contents

Product	Quantity	
Evolution PRO	1	
TGY-iA6C	1	
Micro USB Cable	1	
User Manual	1	

9. Appendix 1 FCC Statement

This device 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.

NOTE: 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—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 the 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 the 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. (e.g. use only shielded interface cables when connecting to computer to computer or peripheral devices.)

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.

the maximum SAR value is 0.19W/kg

TURNIGY®
power systems



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