

FAI F9A-C CLASS APPROVED

# BALKIN

SKYBALL

## USER MANUAL



Inimitable, overwhelming flight performance.

Using a transmitting and receiving system.

The FHSS type receiver can be installed using the SBUS expansion port.  
ELRS receiver compatible (firmware version 3.3 or higher).



**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.**

**Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.**

**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, 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.

**The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction**



# 1. Caution

(Please pay attention to the points below when using.) ✪

Do not place your hands inside the shell before the propellers have come to a complete stop.

※ When operating the drone, do not fly towards people or animals.

※ Long hair can be dangerous as it gets caught in the rotating propeller.

Wear or tie a hat when flying.

※ When removing the installed shell, first disconnect the Balkin battery or remove the propeller.

※ When replacing the drone battery, store the remote controller safely to prevent others from accidentally operating it.

※ The Balkin is designed to be suitable for indoor flights.

※ Recommended for use by ages 14 and older.

- If the signal is outside the control range of the remote controller, the drone may not be controlled.

- Be careful not to leave the field of vision when operating.

- Flying outdoors under the influence of wind can cause functional decline. We recommend flying indoors.

## Shock Warning

※ In altitude maintenance flight mode, strong impacts cause the altitude maintenance function to weaken. Repeated strong impacts can cause a rapid increase in altitude or loss of control during flight.

- Switch to leveling mode or recalibrate the IMU.

- It does not flip when the power is low.

- Stop using and discard batteries that swell when charging.

- The Balkin uses a 2S (7.4V) lithium polymer battery.



## 3. Product characteristics

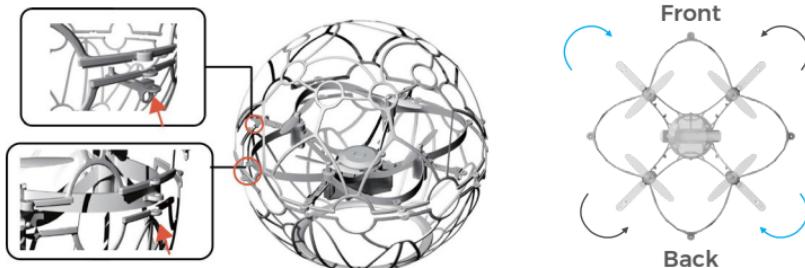
1. For safe use of the product, a power button (=binding button) has been added to the front.
2. Press the power switch on the front three times to activate the binding process, allowing you to easily bind a new transmitter.
3. You can fly multiple drones at the same time, since we were able to solve the problem of unbinding or other drones being controlled due to radio interference that occurs when controlling many aircrafts at the same time in one place. (The maximum number of simultaneous flights can be checked through the Helsel website at [www.helsel.co.kr](http://www.helsel.co.kr).)
4. There is a separate SBUS receiver connection terminal so you can install additional transceivers.  
It can be equipped with receivers of FHSS and ELRS (receiver version 3.3 or higher), which makes it possible to use more drones simultaneously than the existing number of simultaneous uses without interference.
5. Battery reverse current protection has been added to protect the circuit when the positive poles are connected in reverse.
6. When the motor is forced to stop due to an external load, a circuit protection function is activated.
7. Two rear-mounted LEDs allow you to easily identify the rear during flight, making your flight easier.
8. The LEDs mounted on the flight controls come in a choice of 8 colors to identify the player's position during the game.
9. In addition to the basic white shells, red and blue shells can be purchased separately.
10. In order to respond quickly in an emergency situation, you can stop immediately by placing the throttle stick at the lowest position in mode 2 and pressing the upper left button.

## 4. Product composition



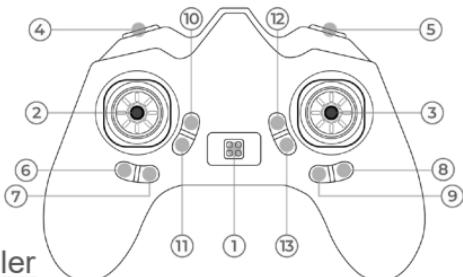
## 5. Assembly method

Complete the assembly of the sphere by inserting the upper shell of the Balkin as shown in the picture and tightening it with the provided screws.



\*Propeller direction notation

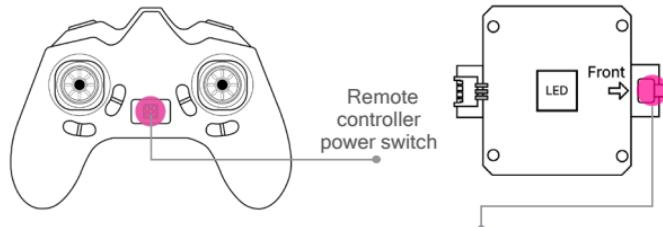
## 6. How to use



### STEP. 01 remote controller

| No. | designation                                      | function   |
|-----|--|--|
| 01  | <b>ON/OFF</b>                                    | ON, OFF  |
| 02  | <b>Left stick</b>                                | Rudder (turn left and right) and throttle (elevation rise and fall)  |
| 03  | <b>Right stick</b>                               | Aileron (move left and right), elevator (forward and backward)   |
| 04  | <b>Altitude/horizon mode</b>                     | Pressing the key switches from altitude maintenance mode to level maintenance mode.<br>Unlike altitude maintenance mode, horizontal maintenance mode does not have an altitude maintenance function.<br>Be careful when operating the throttle when switching modes. |
| 05  | <b>Speed control button</b>                      | The remote controller's buzzer sounds.<br>1st time: low speed, 2nd time: medium speed, 3rd time: high speed  |
| 06  | <b>Flip</b>                                      | Press the flip key and select a direction with the right stick to flip in that direction.  |
| 07  | <b>One-touch takeoff/landing/ emergency stop</b> | Short: takeoff and landing<br>Long: emergency stop   |
| 08  | <b>Headless mode</b>                             | With a short press, the Balkin's front and rear lights will flash slowly simultaneously.<br>(Headless mode is not maintained for a long time.)   |
| 09  | <b>LED color change key</b>                      | Press the corresponding key to select the desired color from 8 colors.   |
| 10  | <b>Forward trim</b>                              | Press and adjust when the Balkin automatically moves backwards when hovering.  |
| 11  | <b>Reverse trim</b>                              | When hovering, press and adjust when Balkin automatically moves forward.   |
| 12  | <b>Left trim</b>                                 | When hovering, press when Balkin automatically moves to the right to adjust it.  |
| 13  | <b>Right trim</b>                                | When hovering, press when Balkin automatically moves to the left to adjust it.   |

## **STEP. 02** How to power on and use



- Turn on the remote control switch first, then press the button located on the front of the Balkin's canopy for 3 seconds to turn on the Balkin.

**\*If you turn on the Balkin before the controller, malfunction or binding may loosen.**

- Do not turn off the remote controller until the flight is completely finished.
- If the remote controller is turned off during flight or is turned off automatically due to low battery, the Balkin may become uncontrollable.
- When replacing the Balkin's battery, do so while the remote controller is turned on
- When the flight is completely finished, first disconnect the Balkin's battery, turn it off, and then turn off the remote controller.
- If the remote controller's battery is low, the remote controller beeps.

**STEP. 02 - a** How to connect the remote controller (binding)

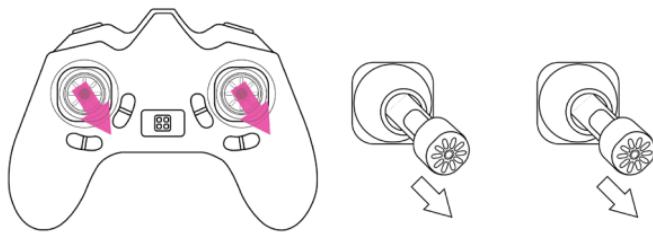
- Turn on the Balkin's aircraft power first, then briefly press the black button on the front of the Balkin three times. The LED blinks and enters pairing standby mode.
- At this time, after turning on the remote controller and positioning the stick as shown in the picture above, the LED will stop blinking and a beep will sound to indicate successful pairing.
- If you initially use the included remote controller, there is no need to pair again.
- If you use several different Balkins at the same time, be sure to pair them one by one.
- If the Balkin's LED continues to blink, reconnect to the remote controller using the above method.

**STEP. 02 - b** How to use SBUS - FHSS, ELRS receiver compatible  
(firmware version 3.3 or higher)

You can use the SBUS receiver separately by connecting the receiver to the SBUS port on the bottom of the FC.

(Using micro JST 1.25mm 3-pin cable)

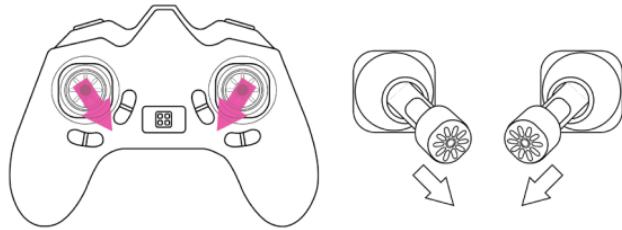
## STEP. 03 IMU calibration



\*\* IMU calibration is recommended before each takeoff.

Place the Balkin horizontally (on a flat surface) and push the left and right sticks down to the bottom right corner simultaneously to enter IMU calibration. The Balkin LED will flash, hold the stick for 3 seconds, the remote controller will sound a buzzer and the LED will stop flashing. This means calibration is complete.

## STEP. 04 How to start



With the controller and Balkin connected, position the controller stick as shown in the picture above and hold it for about 2 seconds, and the motor will start rotating. Return the control stick to neutral and lift the throttle stick up to take off.

**TIP**

It is recommended to take off in altitude hold mode and switch to level hold mode as needed.  
(Takeoff in level maintenance mode is not recommended.)

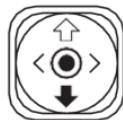
## STEP. 05 Setting and changing remote controller mode

When you turn on the remote controller, a beep sound will sound. (Mode 2: 2 beeps)

Mode 2: Left (ascend/descend), right (forward/reverse)

Mode 1: Left (forward/backward), right (ascend/descend)

**Left stick**



Rise



Descend

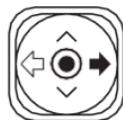
**Right stick**



Forward



Reverse



Left turn



Right turn



Left



Right



**STEP. 05 - a** How to change Mode 1

If you connect the battery to the Balkin and turn it on while pressing both the power button and the speed control button on the top right of the controller, the beep sound will sound three times quickly (mode 1: beep beep beep) and the control mode will change to mode 1.

If you turn the remote controller off and on after flight, it will return to the default mode, Mode 2.

Left stick



Forward



Reverse

Right stick



Rise



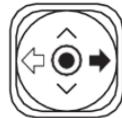
Descent



Left turn



Right turn



Left



Right



## STEP. 06 How to stop the motors

**A**

In altitude hold mode, if you push the throttle stick (left stick) all the way down and hold it for more than 2 seconds, the motor will stop and the engine will turn off.

**B**

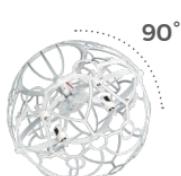
### Emergency stop function

To emergency stop Balkin, place the left stick at 7 o'clock and the right stick at 5 o'clock for more than 1 second to activate the emergency stop function.

**C**

### Emergency stop function

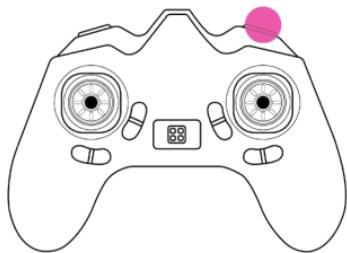
To emergency stop the Balkin, move the left stick to the lowest position in mode 2 and simultaneously press the flight mode change key to activate the emergency stop function.  
**(Only basic remote controller can be used)**

**D**

If the starting angle exceeds 90°, the engine automatically turns off for safety.  
This function may activate if the drone is impacted during a game using Balkin.  
This is not a malfunction, so restart.

**TIP**

If there is no operation for 5 minutes, the remote controller and drone will automatically turn off due to the power saving function.

**STEP. 07** 3-speed control

Buzzer once: Low speed

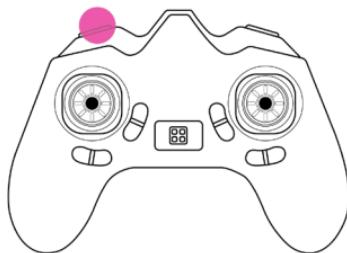
Buzzer twice: Medium speed

Buzzer 3 times: High speed

During flight, you can change the flight speed using the speed control key (5) on the remote controller, and a sound will sound when you change it.

**STEP. 08** Change flight mode \*Flight mode can be changed during flight.

Switch number 4 Click to change.

**Altitude mode**

Balkin maintains altitude using a barometric pressure sensor.

You can increase and decrease altitude by adjusting the throttle stick.

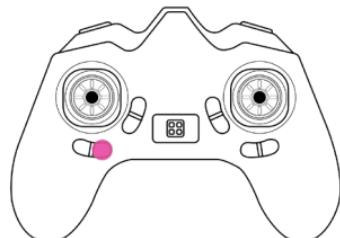
**Horizon mode**

When entering this mode, Balkin maintains levelness in horizon mode and cannot maintain altitude.

(In horizon mode, if you place the throttle stick in neutral, the Balkin will rise.)

**STEP. 09** One-touch takeoff and landing mode

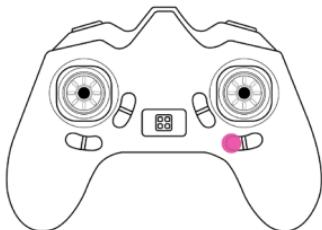
(only works in Altitude hold mode)



▪After starting the Balkin, briefly press the takeoff and landing button (7) once. A beep will sound on the remote controller and the Balkin will automatically take off and hover at a height of about 1 meter.

▪If you briefly press the takeoff and landing button (7) again, the remote controller will sound a beep and Balkin will automatically land at the current location and turn off the engine.

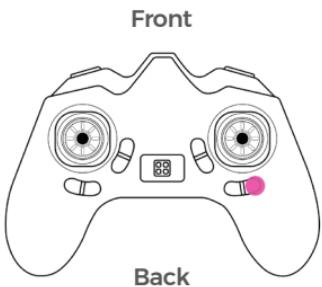
## **STEP.10** LED color change



There is a variable LED light under the Balkin center cover, and the color of the LED can be changed sequentially by pressing the remote controller light change key (9).

(rainbow, blue, red, green, pink, sky, yellow, white)

## **STEP.11** Headless mode



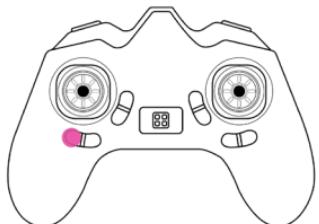
### How to set up

1. Position the remote controller and drone so that they are facing the same direction.  
(At this time, the direction of the remote controller becomes the reference for the front.)
2. Headless mode ON
3. Even if the direction of the drone changes during flight, you can operate the drone based on the direction you initially set.
4. Headless mode cannot be reset during flight.  
If the drone does not go in the direction you want, disable headless mode.

**| Caution |** Headless mode cannot be maintained for a long time.

If it does not work normally, disable headless mode, land and reset to fly.

## **STEP.12** Flip mode



Balkin can flip forward, backward, left, and right.

Press the flip key (button (6)) and select a direction with the right stick to flip in that direction.

**STEP.13** Turtle function

When Balkin is upside down, in mode 2, if you move the left stick to the top, such as 11 o'clock, 12 o'clock, 1 o'clock, etc., it will return to the upright position.

**STEP.14** Low voltage alarm

Primary Low Voltage Alarm (Low Power): Tail lights will flash multiple times, three times per second.

Secondary low voltage alarm (Low power): Tail lights flash several times per second, forced landing, no longer able to fly, and unable to restart.

When the secondary low voltage alarm sounds, turn off the drone and immediately disconnect the battery to cool down before charging. Charging while the battery is overheating may cause fire or damage the battery charger. If the battery is not immediately removed and the drone is left turned on, the battery cannot be reused and cannot be repaired or exchanged.

**STEP.15** Battery charging method

battery



charging cable

## charging the battery

When you connect the battery to the battery charging cable, the green light on the far right blinks.

## fully charged

When the battery is connected to the battery charging cable and fully charged, the green light on the far right turns on.

1



After plugging the battery charging cable into the power source, connect the battery and the battery charging cable.

2



When the battery charge is fully charged, all lights remain on as shown in the image above.



## Battery precautions

\*Use the battery and charger after cooling them down.

\*Battery and charger failures caused by incorrect use cannot be repaired.

## 7. FAQ

|  |  |  |
|--|--|--|
| The remote controller does not turn on.        | If the batteries are not installed correctly, the remote controller will not power on. | Check whether the battery is installed correctly according to the + and - marks on the battery compartment, or try again with a new battery. |
|  | Remote controller power failure.   | Please check and apply for A/S.  |
|  | If the remote controller is not turned on.   | Position the power button to ON.   |
| The Balkin won't start.                        | Check battery connection.  | Check the connection status and connect in the correct direction.  |
|  | Check whether the distance to the remote controller is within the limit.               | Fly within a 200M radius. We recommend flying within sight in an unobstructed indoor environment.  |
|  | Make sure it is not a disconnected remote controller.                                  | Check the remote controller, check the remote controller connection method in the manual, and try to reconnect.                              |
| Start/Stop/IMU calibration cannot be performed | Make sure you are in Altitude mode.  | Turn on Altitude mode.   |
|  | Check the status of the remote controller.   | Turn on the remote controller and rebind it.   |
| Altitude is not maintained                     | Altimeter failure  | Please apply for A/S.  |
|  | Temporary operational failure due to excessive shock                                   | Perform IMU calibration again.   |
|  | Make sure you are in altitude mode.  | Turn on altitude mode.   |
| Soar up in altitude mode                       | Check if the propellers are damaged.   | Check and replace the propellers.  |
|  | If the Balkin is shaken or shocked too much.   | Turn the power off and on and try again.   |
| Balkin's flight performance is strange.        | If the screw is loose.   | Tighten without shaking.   |
|  | Damage to central bracket.   | Check and replace.   |
|  | If the propellers are severely damaged or installed in the wrong direction.            | Check and replace.   |

|                                   |   |   |
|-----------------------------------|---|---|
| <b>The motor does not rotate.</b> | Replace motor.                          | Please apply for A/S.   |
| <b>Each switch does not work.</b> | Poor contact condition of switch.       | Please apply for A/S.   |
| <b>The Balkin is not rising.</b>  | Low battery.                            | Replace the Balkin's battery.   |
|                                   | The remote controller's battery is low. | Replace the remote controller's batteries.                              |
| <b>The motor doesn't stop</b>     | Pull the throttle stick all the way.    | Hold the throttle stick at the lowest position for more than 2 seconds. |
|                                   | Turn off the engine in altitude mode.   | Switch to altitude hold mode.   |

## 8. Product Information

|                    |   |
|--------------------|---|
| <b>Size</b>        | 200*200*180 (mm)                            |
| <b>Weight</b>      | 74g (with battery) / 24g (without battery)  |
| <b>Battery</b>     | 7.4V 450mAh 2S 25C lithium polymer battery  |
| <b>MTOW</b>        | 99g   |
| <b>Flight time</b> | Approximately 6 minutes (based on hovering) |
| <b>Distance</b>    | Distance: Within 100m<br>Height: Within 20m |

This manual may be changed to improve performance, and the latest updates can be found at <https://www.helselgroup.com/support>.

