iKon Flybarless Instruction Manual

Thank you for purchasing the iKon flybarless controller! Below are instructions to guide you through the setup of your iKon flybarless unit - if you are unfamiliar with this unit, please browse the below information before you get started.

You may wish to print these notes and use them as a reference as you setup your iKon. However, note that the below details are included in the setup Wizard, which will take you step by step through the setup process, providing all the below details in an orderly manner.

Feel free to go directly to the iKon Wizard to begin your setup process, and the Wizard will walk you through your setup, ending with a perfectly tuned helicopter that is ready for flight.

Before you begin, please visit www.ikonflybarless.com, select "download" on the top of the page, and download the latest software for your iKon unit. After this software has been downloaded to your computer, please install the software, and then run the software to begin setting up your iKon unit.

Note that before you run the software, please ensure that your iKon is connected to the computer via the included micro USB cable, and that the iKon is powered up using your regular servo/receiver power supply. Once done, you can utilize the "Wizard" feature to make all necessary adjustments to your iKon unit, and update the iKon firmware as well.

Want to Make This Easy?

Visit www.ikonflybarless.com, download the software for your iKon unit, and simply follow the step by step instructions the "Wizard" feature offers - all below information is fully covered, and the below information is simply a reference point for those wanting written information.

iKON FLYBARLESS SYSTEM SAFETY NOTES

Radio controlled (R/C) helicopters are not toys! The rotor blades rotate at high speed and may cause serious injury or death. All common safety rules for R/C models must be followed, along

with local rules and regulations. You can gather information from your local R/C model club, or from your national model association.

Please pay attention to your own safety and the safety of other people and property when using our product. Always fly in areas away from other people or animals. Never use R/C models in close proximity to areas of housing or crowds. R/C models may malfunction or crash due to piloting mistakes, mechanical issues, or radio interference, and have the full ability to cause severe accidents. Pilots must be fully responsible for their actions, and must be fully responsible for damage, injuries or otherwise caused by the usage of their models.

The iKON FLYBARLESS SYSTEM is not a flying aid for beginner / novice pilots! This unit replaces the conventional mechanical flybar previously found on most R/C helicopters. It is required that you have flying experience and that you are experienced in the operation of R/C helicopters in order to use our iKON FLYBARLESS SYSTEM. We also suggest you seek the help of an experienced helicopter pilot before you undertake the first flight of your model.
Please carefully read the instructions included in the setup wizard before the first use of your iKON FLYBARLESS SYSTEM. Allow sufficient time for the setup procedure, and be sure to check each step carefully. A wrong system setting can lead to a serious accident, along with severe damage to the model.

R/C models consist of mechanical and electronic components. It is necessary to protect the model from moisture and other foreign substances. If the model is exposed to moisture, this may lead to a malfunction, which may cause damage to the model, or a crash. Never fly in the rain or extremely high humidity.

Do not expose the iKON FLYBARLESS SYSTEM to extreme temperature variations. Before powering up the system, wait a short time so the electronics can acclimatize.

When operating a helicopter with an iKON FLYBARLESS SYSTEM, ensure the receiver power supply is of sufficient load capacity. Because of the direct coupling of the rotor blades to the servos, the servos are exposed to increased actuating forces. In addition, because of the intermediary electronic gyro system, the servos are continuously driven.

These factors lead to significantly greater power consumption compared to a flybar helicopter. When operating electric helicopters (particularly those with single-line receivers), be certain the electric motor cannot start inadvertently during the setup procedure.

We recommend disconnecting the electric motor from the ESC during the setup procedure. Prior to initial flights, please slide the motor/pinion away from the main gear and check that the motor does not to start inadvertently when the receiver is switched on.

Please download the latest configuration software from:

http://www.ikonflybarless.com/downloads/setup.zip

iKon Flybarless Manual 1.0

Basic Wizard

Panel 1 – General Instructions:

The basic wizard is a walkthrough configuration tool that will guide you through the initial setup of your unit. We strongly advise all pilots use the Basic Wizard each time they setup a new model. Following this basic setup, the advanced panel of the application can be activated for fine tuning. Due to the complexity of the advanced panel, it must be used carefully, with only small adjustments being made. Once the basic wizard setup is complete, the unit will deliver 95% of its potential and will perform flawlessly for almost all users and flying styles.

1. On an electric helicopter, disconnect the motor from the ESC, or remove the pinion.
2. Connect the unit to the PC using the provided micro-USB cable.
3. Power up the unit.
4. Start the Unit configuration application.

The basic wizard will start automatically. At the top, there are a series of images indicating all the steps - the step you are working on is highlighted. Arrows to the sides of the step images let you go back and forth through the basic configuration wizard. We recommend you systematically complete each step in turn, carefully reading the instructions on the left side of each page shown. The Wizard instructions explain each step of the configuration process.

Once the current step is completed, you move to the next step by clicking on the next icon on the top row, or clicking on the right arrow.

Panel 2 – Receiver Configuration:

Select the type of configuration you will be using in your helicopter, and then connect your unit as shown in picture which reflects your setup.

Panel 3 – Receiver Selection:

Select the type of the receiver you are using.

1. Standard Receiver: Select this option if you are using a standard (external) receiver of any brand. Connect this to the unit using the provided cables.

2. Futaba S-Bus Receiver: Select this option if you are using a S-Bus receiver connected to the unit with a single cable into the S-Bus port.

3. Spektrum DSM2 Satellite: Select this option if you are using 1 or 2 external Spektrum satellites using DSM2 technology. Make sure you connect the satellites to the correct ports on the side of the unit.

4. Spektrum DSMX Satellite: Select this option if you are using 1 or 2 external Spektrum satellites using DSMX technology. Make sure you connect the satellites to the correct ports on the side of the unit.

Binding Procedure for Spektrum Satellites: Plug a bind plug into the units bind connector, power on the unit, and then the satellites will blink. Proceed now as you would when binding any receiver.

Panel 4 – Transmitter Setup:

Set the swashplate type in your transmitter to basic one servo (90°) mixing.

Aileron: Set your Tx endpoints so that with full stick deflection the panel indicates +-100%
Elevator: Set your Tx endpoints so that with full stick deflection the panel indicates +-100%
Tail: Set your Tx endpoints so that with full stick deflection the panel indicates +-100%
Pitch: Set your Tx endpoints so that with full stick deflection the panel indicates +-100%

Gain:
Set the gyro gain from your Tx so that it shows a value of 45% on the panel. Depending on the transmitter you are using, either positive or negative gains will trigger the Heading Lock function on the panel.

Throttle:
Set your Tx endpoints so that with full stick deflection the panel indicates +-100%

Aux:
Not assigned

Current Setup:
This field indicates which setup is active at the moment. Assigning a switch to this function (default channel 7) lets you switch between setups. There are 3 different setups available.

When matching your transmitter to the software, make sure that the direction of the stick movement and what is indicated in the software match. If the stick input and software output do not match, use the servo reverse function in the transmitter to correct this.

Panel 5 - Servo Selection:

Cyclic Panel

All cyclic servos MUST be of the same model number (manufacturer and characteristics).
Be very careful when choosing the servo refresh rate as a wrong setting could damage your servos permanently. Regardless of refresh rate, the centre pulse of the cyclic servos will be set at 1520us.

Analog Servos:
Choose this option for all analog servos. The refresh frequency will be set to 50Hz.

Digital Servos:
Choose this option for mid range digital servos. The refresh frequency will be set to 120Hz.

High End Digital Servos:
Choose this option for high end digital servos. The refresh frequency will be set to 200Hz.

Frequency:
If you know refresh rate of your servos you can choose it here and not select any of the above buttons.

Tail Panel

Be very careful when choosing the servo refresh rate and centre pulse, as a wrong setting could permanently damage your servos. ONLY digital servos are supported on for the tail.

Digital Servo:
Choose this option for standard digital servos with standard centre pulse (1520us)

Specific Digital Servo:
Choose this option for mid range digital servos (333Hz refresh rate) with half frame rate centre pulse (760us)

High End Specific Servo:
Choose this option for high end digital servos (560Hz refresh rate) with half frame rate centre pulse (760us)

Frequency:
If you know the refresh rate of your servo, you can choose it here.

Panel 6 – Swashplate Type Selection:

Click on the button that matches the swashplate type of your helicopter.

Plug the servos into the unit using the correct positions as shown in the diagram of the swashplate.

SRV1 swashplate---→SRV1 on Unit
SRV2 swashplate---→SRV2 on Unit
SRV3 swashplate---→SRV3 on Unit

Panel 7 – Swashplate Setup:

When in the servo setup panel, the unit will enter check mode. This mode has a very large dead band at middle stick, so finding middle (neutral) position is much easier.

Servo Reverse:
This button sets the correct direction of each servo. Push your pitch stick to max and click the 'Dir' button until the swashplate moves to the full positive pitch position. Once done, confirm that stick movement and swashplate movement are correct.

SRV1: Move the pitch stick to the middle position and use the + and – buttons to level the horn on servo SRV1

SRV2: Move the pitch stick to the middle position and use the + and – buttons to level the horn on servo SRV2

SRV3: Bring Move the pitch stick to the middle position and use the + and – buttons to level the horn on servo SRV3

After all servo horns are at 90° (with the pitch stick in middle position), mechanically set the head so the blade grips are at zero degrees pitch.

Cyclic:
Use the + and – buttons to increase or decrease cyclic throw (while holding the cyclic stick at full deflection). Maximize cyclic throw without binding.

Pitch:
Use the buttons + and - to increase or decrease max and min pitch. Set the pitch range to suit your flying style.

Panel 8 – Tail Setup:

Servo Reverse:
Use this button if the stick movement doesn't match the tail movement (stick left/nose left, stick right/nose right).

Nose Left:
Fully deflect the tail stick to the left and use the + and – buttons to adjust servo throw until the tail pitch slider moves all the way toward the left tail direction.

Nose Right:
Fully deflect the tail stick to the right and use the + and – buttons to adjust servo throw until the tail pitch slider moves all the way toward the right tail direction.

Rotor Rotation:
Select CW or CCW based on the rotation of your helicopter main rotor.

Pitch Precomp:
Check this option to activate pitch to tail mix.

Cyclic Precomp:
Check this option to activate cyclic to tail mix.

People flying with a reversed tail (stick left/nose right, stick right/nose left), please setup the tail EXACTLY as described above, and reverse the tail channel in your transmitter ONLY AFTER the helicopter configuration is complete.

Panel 9 -- Unit Orientation:

Click on the button that matches how the unit is mounted in your helicopter.

Set Level:
Position your helicopter as flat as possible (as it would be during hover) and press the set level button. This is the zero position the swashplate will be set to when auto-level is activated in flight.

Panel 10 – Governor Setup:

Please check panel 3 to see the correct connection of the sensor to the Gov port.

Gear Ratio:
Enter the main gear to pinion ratio (main gear teeth / pinion teeth) or alternatively click on the calculator and enter the main gear and pinion tooth count - the software will automatically calculate the gear ratio.

Sensing Divider:
On nitro helicopters this parameter will be set to 1. On electric helicopters this is the number of motor poles divided by 2 (for example the sensing divider for a 10 pole motor will be 5).

Speed 1: Set speed 1
Speed 2: Set speed 2
Speed 3: Set speed 3

Speed switching is accomplished using the transmitter throttle curve using the following rules:

0-25%   throttle curve ---> No Gov
25%-49%   throttle curve ---> Speed 1 (flat line 30% recommended)
50%-74%   throttle curve ---> Speed 2 (flat line 60% recommended)
75%-100% throttle curve ---> Speed 3 (flate line 100% recommended)

If the throttle curve setup is correct, the selected speed should be highlight when toggling the idle-up switch. Please be sure the motor cables and/or pinion are disconnected before toggling the idle-up switch.

Gain:
The default setting of 50% will fit most flying styles and models. A higher gain will have a more reactive governor action, while a lower gain will have a smoother governor action.

Reverse:
Use the reverse button to match servo movement and carburettor opening on nitro machines if the throttle action is reversed.

Use the + and – buttons to set max and min throttle servo movement related to the carburettor barrel.

Panel 11 -- Model Size Selection:

Select the size of your model (or the closest matching size).

Panel 12 – Flying Style Setup:

On each setup panel you can select the flying style to be active in that particular setup.

To select the flying characteristics of a setup, just click on the flying style you desire for that setup.

Each setup can have totally different flying characteristics. You can change between different setups during flight using the assigned setup switch.

The active setup is highlighted in green - (confirm the chosen switch highlights the setup as expected).

Use Governor:
Check this option if you want to use the governor in that particular setup.

Use Autolevel:
Check this option if you want to use autolevel in that particular setup.

Cyclic gain:
During the basic setup, the cyclic gain is set to a default value based on the model size selected (step 10). If, during flight, the helicopter shakes, try lowering the cyclic gain by 2-3% at a time until the shaking stops. If the helicopter feels soft and not 'locked in', try raising the cyclic gain by 2-3% at a time until the model has a 'locked in' feel.

Agility:
This parameter sets the overall helicopter flying characteristics. Higher agility values make the helicopter feel more natural, and more "flybar like". Lower agility values make the helicopter more locked in during flight.

Panel 13 - Final Checks and Tuning Tips:

After powering up the unit, the red and green led's will alternately flash during boot up. Leave the helicopter still until the green led is solid. The red led will flash one, two or three times, indicating the setup parameters selected.

Check that all servos move correctly to stick inputs (cyclic servos and tail servo).

Check swash plate gyro corrections. If everything is configured correctly the swash plate must react to helicopter movements as in the pictures. Do not attempt to fly the helicopter if the swash plate is not reacting as shown.

Check tail gyro corrections. Yaw (rotate) the helicopter and make sure the tail compensates correctly.

For the first flights, we recommend using the default parameters as configured during basic wizard setup.

If on the first lift-off the helicopter has cyclic shakes, lower the cyclic gain in wizard panel 12. Lower the gain 2% at a time until the shaking stops.

During the first few flights, raise the tail gyro 5% at a time until the tail starts to shake (wag), then lower the gain 5% (optimum gain).

We recommend having around 10 flights to get accustomed to the units flying characteristics before fine tuning to suit your own preferences.

Fine tune using the advanced menu. Each parameter has "mouse over" instructions or descriptions. Please change one parameter at the time, and never exceed a 5% change between tests.