

PowerBox Systems®

*World Leaders in RC
Power Supply Systems*

Instruction Manual



iGYRO®
EXTRA

1. PRODUCT DESCRIPTION

The **iGyro 3xtra** ushers in the second generation of the **iGyro** family. The new **iGyro 3xtra** boasts a completely revised set-up procedure and regulatory algorithm, expanded features and enormously enhanced performance, making it the new "State of the Art".

In contrast to its predecessor - the 3e - the new **iGyro** no longer incorporates delta and V-tail mixers. Instead the **iGyro** has a new, simple learning process enabling it to detect all servo mixer combinations, which can even include differential and unequal travels. The user simply sets up delta control surfaces, V-tails, flaperons and tailerons at the transmitter in the usual way. A sophisticated three-dimensional algorithm then divides up the control commands again into aileron, elevator and rudder for all five inputs individually. This method ensures accurate suppression of the individual axes when control commands are given, or when the heading function is in use.

Another significant innovation is the learning process for the installed position of the gyro: this simply involves movements of the model itself. At the same time the procedure also defines the directions of effect in the **iGyro**. In the past many pilots have been unsure whether they have actually set the direction of effect correctly, but this doubt is now eliminated.

If you are at the flying field and don't have a smartphone with **BlueCom Adapter** or a laptop with **USB Interface Adapter** to hand, you can very easily adjust the gyro's gain for each axis individually and accurately using the transmitter sticks - without any additional equipment at all!

The hardware has also been subtly improved: the unit now features comprehensive ESD protection to provide a complete shield against static charge problems in the model.

Supplementary features such as gyro characteristics, stick priority and lock-in feel also give experts the means to customise the **iGyro 3xtra** to their exact personal requirements.

2. INSTALLATION, CONNECTIONS

The **iGyro 3xtra** can be installed in any position in the model - provided that it is parallel to or at right-angles (90°) to the direction of flight. The result of installing it at an angle would be mixed corrective effect. For example: a gust affecting the aileron axis might cause the gyro to correct the elevator and rudder at the same time.

Mount the **iGyro** on a clean, smooth surface, then connect it to the receiver using the patch leads supplied. The **iGyro** has two aileron inputs, two elevator inputs and one rudder input.

The Gain input is absolutely essential if the **iGyro** is to function correctly, and you need to set up a rotary control or slider (up to +/- 200%) at the transmitter for this. Once you have established the correct settings during a set-up flight, the percentage values for this transmitter control can be programmed permanently onto a switch, enabling you to activate or disable the **iGyro**, or select a second mode.

The following wiring diagrams should be observed if you are using a delta / V-tail model; note that it is also possible to control model deltas with four control surfaces:

Delta A: connect the two pairs of control surfaces to **Aile-A** and **Elev-A**

Delta B: connect the two pairs of control surfaces to **Aile-B** and **Elev-B**

V-tail: connect the two pairs of control surfaces to **Elev-A** and **Rudder**

Delta – vector models: Delta A as described above; **Elev-B** can be used for the vector.

The mixing arrangements for the delta and V-tail functions are set at the transmitter in the normal way. You don't need to worry about differential or unequal travels, as the 3D algorithm detects this, and ensures that the axis inputs are separated again without error.

The servos can be connected to the outputs once you have completed the connections at the receiver end. Now switch the system on - and your servos will move exactly as programmed at the transmitter.

Check the Gain input: in the centre position the gyro function is disabled: all LEDs are off.

If you now move the Gain control from 0 to +100% you activate range A: as standard all LEDs now light up green to indicate normal damping mode.

If you now move the Gain control from 0 to -100% you activate range B: as standard the two LEDs at the aileron input now light up orange to indicate that Attitude Assist is active. All the other LEDs glow green for normal damping mode. We strongly recommend this mode!

3. CONNECTING THE GPS

The **iGyro** is the world's only gyro to offer speed-dependent gain regulation. To use this feature all you need is a **GPS II** sensor connected to the MISC input; the GPS unit must be set to **PowerBox/iGyro**. Gain regulation is fully automatic, but please remember that the GPS must be plugged in when you adjust gain in flight.

4. SETTING UP

There are two different procedures: one for a model which has already been test-flown without a gyro, and the second for a new, untried model:

a) New model

- Set the installed position
- Test-fly the model including trims, differential, etc.
- Learn the centre and end-points
- Set up the **iGyro** in flight using the Gain control
- Fine-tune the individual axes if necessary

b) Test-flown model

- Set the installed position
- Learn the centre and end-points
- Set up the **iGyro** in flight using the Gain control
- Fine-tune the individual axes if necessary

4.1 SETTING THE INSTALLED POSITION

The installed position of the **iGyro 3xtra** is detected by defined movements of the model. The first step in learning the installed position is to press the white button on the **iGyro** and hold it pressed in while you switch the model on.

You can release the button as soon as the red LEDs cycle. Keep the model as still as possible while the gyro sensor carries out its self-calibration process. The green LED at AILE-A lights up to indicate that the **iGyro** is ready.

The next step is to raise the model's tail briskly - high enough to cause all five LEDs to light up green - and hold the model firmly in this position. The elevator outputs also reflect this movement, but

do not worry about the direction of travel, as this is only intended as a supplementary indicator in case the LEDs are not in your line of sight. Once the **iGyro** has detected the movement, the elevator outputs will return to neutral. If the elevators only return slowly to the neutral position, then you did not raise the tail high enough; in this case repeat the procedure.

The next step is to move the model's tail briskly to the right. Exactly as before, the rudder moves in a random direction as you move the tail. Once the movement has been detected the rudder returns to neutral, and the **iGyro** reverts to normal operating mode.

Note: setting the installed position resets all settings of the **iGyro 3xtra**! You should only carry out this procedure with a new model, or if you are re-positioning the **iGyro** in the model.

4.2. LEARNING THE CENTRE AND END-POINTS

During this process the **iGyro** learns the neutral position and end-points. At the same time a sophisticated three-dimensional algorithm determines whether delta or V-tail mixers are present, and it can even cope with differential or unequal travels which are programmed in the mixers. This means that ailerons can double as landing flaps without the flap travel having any influence on the aileron gyro function.

Note: For the learning process any Dual Rate settings must be disabled, to ensure that the maximum control surface travels are learned.

Learn mode is invoked by switching the **iGyro** on and holding the button pressed in for about five seconds. The LEDs will cycle briefly to indicate that you can release the button. The learning sequence is now as follows:

- The AILE LEDs light up green: move the aileron stick on the transmitter to the right-hand end-point
→ then press the button

- The AILE LEDs light up red: move the aileron stick on the transmitter to the left-hand end-point → press the button
- The ELEV LEDs light up green: move the elevator stick on the transmitter to the bottom end-point (back) → press the button
- The ELEV LEDs light up red: move the elevator stick on the transmitter to the top end-point (forward) → press the button
- The RUDDER LED lights up green: move the rudder stick on the transmitter to the right-hand end-point → press the button
- The RUDDER LED lights up red: move the rudder stick on the transmitter to the left-hand end-point → press the button

At the end of this sequence the gyro automatically reverts to normal operating mode. You can now advance the Gain control, and check the direction of gyro effect. At the same time check that your programmed mixers are taken into account correctly in the gyro effect.

Once you have correctly set the installed position and end-points, your **iGyro 3xtra** is ready for the model's set-up flight.

Note: if you subsequently alter the trims or end-points (travels), this learning process should be repeated. Generally speaking, minor changes to the trims or end-points have a barely perceptible influence on the gyro's action, but if - for example - you use Attitude Assist on aileron, a trim change will disable this, as Attitude Assist on all **iGyros** is only active in the learned centre position.

4.3. GAIN ADJUSTMENT FOR INDIVIDUAL AXES

All the settings of the **iGyro 3xtra** can be adjusted using a smartphone running Mobil Terminal and the **BlueCom Adapter**, or using the PC Terminal program and **USB Interface Adapter**. The adjustment most commonly required is the fine-tuning of gain on individual axes. The Gain channel adjusts gyro gain on all axes simultaneously, whereas the feature described below enables you to fine-tune the gain on individual axes - without additional equipment.

Switch the **iGyro** on, then press the button five times in rapid sequence. Locate the stick which controls the axis you wish to adjust, and move it once in order to select that axis. Now move the stick again to alter the gain of this axis (or axes) by 5%.

For example, if you need to increase or reduce gain on the elevator, move the elevator stick once. A red LED indicates the centre, i.e. this is the starting point. Now move the stick forward once to increase elevator gain by 5%; move it a second time for an additional 5%. Moving the stick towards you reduces gain by 5%. You can check the gain position by observing the LEDs, as each green LED indicates a 5% increment.

If you want to fine-tune another axis, move the corresponding stick once in order to select that axis, then move it again to adjust the gain in 5% increments.

When you are finished, pressing the button stores all the settings and quits setup mode.

Note: if you select setup mode again, you can adjust the axes by a further 10% in each direction. Any change you make in this way affects both ranges A and B.

5. ADDITIONAL FEATURES

The default settings of the **iGyro 3xtra** are ideal for the vast majority of pilots. Nevertheless, we have incorporated a range of Expert functions in order to cover all possible applications.

- Attitude Assist:

We selected the term Attitude Assist because the **iGyro's** "heading" differs significantly from the Hold modes of other manufacturers. Attitude Assist can even be used with complete safety on elevator, without risking an unwanted stall, as it is only active at the centre position of the stick. As soon as the stick is moved, Attitude Assist is disabled, and the model's control 'feel' is exactly as normal. By default Attitude Assist is active on aileron in range B.

- Gyro characteristics:

This value can be used to harden or soften the regulatory characteristics of the **iGyro**. If the model is clearly self-correcting when flying in gusty conditions, alter the value in the direction of **Soft**; on the other hand, if you think that the **iGyro** responds too slowly to gusts, alter the value in the direction of **Ultra**.

- Stick priority:

The default setting for this is 100%, i.e. the gyro function is completely suppressed when the stick reaches either end-point. If you adjust Stick Priority to, say, 200%, then the gyro function is fully suppressed when the stick reaches the half-way point. This makes the model more agile, but you lose gyro effect more quickly with increasing stick movement.

- Lock-in feel:

This feature alters the 'locking' characteristics in aerobatic manoeuvres such as four-point rolls. If this value is set too high, you will notice the model "overshoot" at the moment you release the stick. If the value is set too low, the model may appear not to stop cleanly when commanded.

- Airspeed factor:

This value defines the progression of gyro gain as airspeed changes. The setting only has a function if the **GPS II** is plugged into the gyro's **MISC** socket.

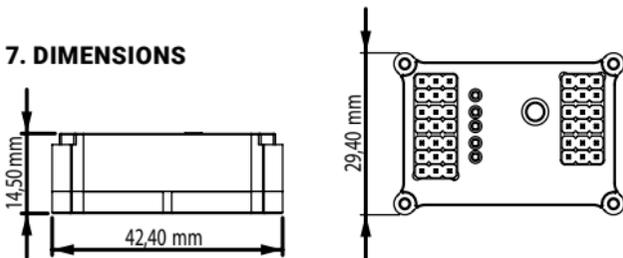
Increase the airspeed factor if the model displays good gyro performance at low and medium speed, but tends to oscillate at high speed.

6. SET CONTENTS

- iGyro 3xtra

- 6 x 3-core patch-lead, 20cm
- 1 x self-adhesive pad
- Operating instructions in german and english
- Quickstart manual

7. DIMENSIONS



8. SERVICE NOTE

We make every effort to provide a good service to our customers, and have established a Support Forum which covers all queries relating to our products. **Please use the Support Forum before you contact us by telephone.** You can find the forum at the following address:

www.forum.powerbox-systems.com

9. GUARANTEE CONDITIONS

We take the maintenance of the highest quality standards very seriously. That is why **Power-Box-Systems GmbH** is currently one of the few RC electronics manufacturer certified to the Industrial Norm **DIN EN ISO 9001**.

That is why we are able to grant a **36 month guarantee** on our **iGyro 3xtra** from the initial date of purchase. The guarantee covers proven material faults, which will be corrected by us at no charge to you. The guarantee does not cover damage caused by incorrect usage, e.g. reverse polarity, excessive vibration, excessive voltage, damp, fuel, and short-circuits. The same applies to defects due to severe wear.

10. LIABILITY EXCLUSION

We are not in a position to ensure that you observe our instructions regarding installation of the **iGyro 3xtra**, fulfil the recommended conditions when using the unit, or maintain the entire radio control system competently.

For this reason we deny liability for loss, damage or costs which arise due to the use or operation of the **iGyro 3xtra**, or which are connected with such use in any way. Regardless of the legal arguments employed, our obligation to pay damages is limited to the invoice total of our products which were involved in the event, insofar as this is deemed legally permissible.

We wish you every success using your new **iGyro 3xtra** and hope you are completely satisfied with it!



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