

PowerBox Systems®

*World Leaders in RC
Power Supply Systems*

INSTRUCTION MANUAL



iESC 65.8
iESC 125.8 V2

Intelligent 32-Bit Brushless Speed Controller

Dear PowerBox customer,

Congratulations on your new **PowerBox iESC brushless speed controller**. The **iESC** is based on the latest generation of controllers for brushless motors, with a 32-bit processor and expanded functions such as telemetry and the ability to adjust settings directly from the transmitter. The high-performance micro-processor ensures smooth running for brushless motors with up to 40 poles.

Brake power, motor timing, direction of rotation, BEC output voltage, free-wheel, helicopter mode and much more can be adjusted directly from a **PowerBox** or Jeti transmitter. This means that set-up boxes and plug-in jumper cards are now a thing of the past.

The **iESC** provides a comprehensive set of telemetry data for **PowerBox**, Jeti and Futaba transmitters, including battery voltage, current, consumed capacity, rotational speed and controller temperature.

A high-performance BEC rated at 8A – or 10A in the case of the **iESC 125.8 V2** – which supplies power to the receiver via two 0.5 mm² patch leads, rounds off the feature set.

Features:

- High-performance brushless speed controller with 32-bit technology
- Latest generation of MosFets for reduced power loss and maximum possible reliability
- Telemetry for **PowerBox**, Jeti and Futaba radio control systems
- Fixed-wing and Helicopter modes
- Adjustable direction of rotation, timing, battery type, freewheel, start-up current and other parameters
- Adjustable regulatory parameters in helicopter mode
- Parameters directly adjustable from **PowerBox** and Jeti transmitters
- Parameters for all systems can be adjusted via the separately available **Mobile Terminal** (order no. 9025)
- 8A (**iESC 65.8**) or 10A (**iESC 125.8 V2**) BEC
- Power-on self-test checks motor, throttle position and voltage
- Ingenious case design ensures optimum cooling

Specification:

Type	Current load cont. / peak	LiPo cells	BEC output	Dimensions (mm)	Weight (g)	Adjustable parameters
iESC 65.8	65A/75A	3S - 6S	6.0V/7.4V/8.4V 8A	60 x 36 x 20	65	yes
iESC 125.8 V2	125A/135A	4S - 8S	6.0V - 12.0V 10A	90 x 43 x 25	165	yes

1. CONNECTIONS

First connect the **iESC** to the motor. Later on you can reverse its direction of rotation by swapping over any two of the wires - although this is also easily achieved with a software setting.

Connect the brown / red / yellow lead to the throttle channel of your receiver, and set the throttle channel at the transmitter to -100% to +100%.

Telemetry is available for the following three systems; the telemetry system in use is automatically detected:

PowerBox P²-BUS

Connect the blue / red / white patch lead (supplied) to the **P²-BUS** input at the receiver. You can adjust all the controller's parameters conveniently using the Telemetry menu.

Jeti EX-BUS

Connect the blue / red / white patch lead (supplied) to one of the EX-BUS inputs at the receiver. You can adjust all the controller's parameters conveniently using the JetiBox menu.

Futaba S.BUS2

Connect the blue / red / white patch lead (supplied) to the S.BUS2 input at the receiver. You can adjust all the controller's parameters using the **Mobile Terminal**.

All other systems

Connect the blue / red / white patch lead (supplied) to the Battery input or any vacant channel at the receiver to act as additional power supply. You can adjust all the controller's parameters using the **Mobile Terminal**.

Before you connect the flight battery:

Please note that incorrect or negligent handling of an electric motor can result in serious personal injury. For this reason it is essential to observe the following **safety instructions**:

- **Always** remove the propeller from the motor before carrying out any adjustments to the **iESC**.
- Check that the flight battery is connected with correct polarity.
- Ensure that the throttle channel lead is connected to the correct receiver socket.
- Never attempt to exert any force on the motor using your hands.
- Do not connect the **iESC** to a buffer battery or any other power source.

Now connect the flight battery to the speed controller. A small spark will occur when the pack is connected. This is completely normal, and indicates that the two large capacitors are being charged up at that moment. Wait until the beep sequence concludes.

If the controller continues to beep, this probably indicates that the throttle channel is reversed. If that is the case, simply reverse the throttle channel at the transmitter.

If the throttle channel is correctly set up, the **iESC** confirms this by emitting a series of beeps corresponding to the number of LiPo cells in the battery. For batteries with more than 6S, a long beep indicates 5 cells, whilst a short beep indicates the individual cells. For example, an 8S battery would be confirmed by 1 long beep and 3 short beeps.

If the speed controller is set to an excessive throttle position at start-up, you need to calibrate the throttle channel. This is the procedure:

- Remove the propeller from the motor!
- Switch your transmitter on, and set the throttle stick to full-throttle.
- Connect the flight battery to the **iESC**, and wait 2 - 3 seconds.
- When you hear two short beeps "B-B", move the throttle stick to the Idle position.

- The **iESC** is now calibrated, and emits a series of short beeps corresponding to the number of cells in the battery, followed by one long beep.
- The **iESC** is now ready for use.

2. STANDARD OPERATION

In normal use it is important to check that the throttle stick is in the **OFF position** before you connect the flight battery. When you connect the battery, the **iESC** confirms readiness by emitting a series of beeps corresponding to the number of cells in the battery to which it is connected. This is followed by one long beep to indicate that the **iESC** is now ready for use.

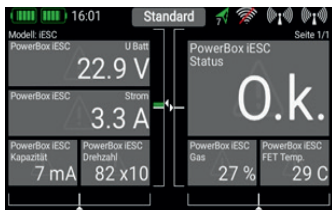
Please note:

- Adjustments you make to the settings of the **iESC** via the transmitter menu or the **Mobile Terminal** are only stored when the motor is stationary.
- The controller has no provision for use with a buffer battery. With the **iESC 65.8** and **iESC 125.8**, connecting a power source in parallel with the BEC will damage the BEC. The **iESC 125.8 V2** can be operated in parallel with a buffer battery (max. 8.4V), although this is not recommended. For a clean backup solution, use our **ESC Backup** (order no. 5117). This keeps the BEC and buffer battery separate, and even a short-circuited BEC will not affect the model's controllability.

3. TELEMETRY FUNCTION

The **iESC** provides a range of telemetry values which are passed directly to the screen of **PowerBox**, Jeti and Futaba radio control system transmitters. The following data are collected by the **iESC**, and sent to the transmitter:

- Battery voltage
- Current
- Consumed capacity
- Rotational speed (number of motor poles can be adjusted)
- Temperature of the **iESC**
- Status (**PowerBox** only)



If you are using a **PowerBox** or Jeti system the available telemetry values are displayed on the transmitter screen in your preferred arrangement.

If you use a Futaba system: erase the Sensor List, and assign your sensors in the Sensor menu as follows:

Sensor		x1550 Hold	7.9V		1/3
Sensor type		ID	Sensor type		ID
1	Curr.F1678	0	7	Voltage	
2	Curr.F1678		8	---	
3	Curr.F1678		9	---	
4	rpm sensor	0	10	---	
5	Temp-F1713	0	11	---	
6	Voltage	0	12	---	

4.PARAMETER ADJUSTMENT

The **iESC** provides a range of adjustment facilities which enable you to match the **iESC** perfectly to your motor, battery and personal preferences.

PowerBox (Telemetry menu) and Jeti (JetiBox) pilots can make these adjustments directly from the transmitter. For all other systems the **Mobile Terminal** (order no. 9025) is available separately.



Description of the adjustment parameters:

Parameter	Description	Adjustment range	Standard value
Brake power	The higher the value, the faster the motor stops.	0% – 100%	0%
Motor timing	Alters the control characteristics of the motor. Increasing this value can result in higher performance, but also leads to higher motor temperature. A lower value increases efficiency.	0° – 30°	15°
Direction	Reverses the direction of rotation of the motor.	CW / CCW	CW
Freewheel	Synchronises motor speed with the throttle stick. A positive effect is faster throttle response. It also increases efficiency.	OFF / ON	OFF

Cell count	Number of cells in the battery connected to the system. The Auto function very reliably detects the cell count. If this is not the case, e.g. if LiFe cells are used, you can enter the cell count manually.	AUTO 3 – 6	AUTO
Power-off voltage	Defines the cut-off voltage per cell.	2.5V / 3.0V / 3.2V 3.4V / 3.6V / 3.8V	3.0V
Power-off type	If a discharged battery is detected, the iESC can either switch the motor off immediately, or initially reduce maximum power to 70% .	Reduce Switch off	Reduce
BEC output	At this point you set the receiver voltage you wish to use. If you set a value higher than 6.0V, ensure that every component – such as servos and receiver – is designed for the higher voltage!	iESC 65.8: 6.0V / 7.4V / 8.4V iESC 125.8 V2: 6.0 – 12.0 V	6.0V
Acceleration	Defines how fast the motor's rotational speed increases.	0 / 1 / 2 / 3	1
Start-up power	Defines the current which is delivered to the motor when it starts up.	LOW / MIDDLE / HIGH	LOW
Flight mode	Setting for fixed-wing model aircraft or helicopters. In fixed-wing mode the iESC starts at 5% and increases power in proportion to the throttle stick position. In Heli mode the iESC starts at 40%. From this point the motor speed rises slowly until it reaches the nominal point, after which rotational speed varies according to the throttle stick position.	Fixed Wing Heli	Fixed Wing

Governor parameter P	<u>Heli mode only!</u> Adjusts the governor parameter P (linear input). The higher the value, the faster the speed controller approaches the target speed. Too high a value results in over-shooting.	0 – 10	5
Governor parameter I	<u>Heli mode only!</u> Adjusts the governor parameter I (integral input). The higher the value, the more accurately the speed controller approaches the target speed. Too high a value results in over-shooting.	0 – 10	5
Pole pairs	This value is required in order to calculate the actual rotational speed of the propeller. The value is stated in the data sheet for your motor.	1 – 30	1
Gear 1 and Gear 2	Set a gear ratio to convert the motor speed to the propeller speed. Example: 1:4.5 Gear 1 setting = 10 Gear 2 setting = 45	1 – 255	1

5. SPEED CALIBRATION (HELI MODE ONLY!)

- The throttle stick should be calibrated as described under point 1.
If you have already done that, move to the next point.
- Ensure that Collective Pitch is set to 0°!
- Wait until the self-test has finished.
- Now move the throttle stick to 50%, and the rotor will slowly start to rotate.
The helicopter will not lift off, as collective pitch is still at 0%. As soon as

stable rotational speed is established, move the throttle stick back to Minimum: the rotor now slows down and stops.

- The calibration process is now complete.

6. GENERAL PROTECTIVE SYSTEMS

• **Abnormal voltage input**

The LED flashes if the input voltage is not within the permissible range.

• **Start-up guard**

If the motor fails to start within a period of two seconds, the **iESC** switches off. After this you must re-calibrate the throttle stick before the **iESC** can be operated again. Possible causes: incorrect motor connections, or a stalled motor.

• **Overheating guard** (beep sequence, every two seconds: BB - BB --)

If the temperature of the **iESC** rises above 110°C, the controller reduces power to 70%. The motor is not switched off completely to ensure that a safe landing can be carried out.

• **Throttle signal lost** (beep sequence, every two seconds: B - B --)

The **iESC** reduces power if the PWM signal is lost. After two seconds the motor is switched off completely. The motor runs again as soon as the signal is restored.

• **Overload guard**

The **iESC** immediately switches the current off if a sudden overload situation occurs. One possible cause would be a stalled motor.

• **Low voltage** (beep sequence, every two seconds: BBB - BBB --)

As soon as the set lower voltage threshold is reached, the **iESC** reduces power incrementally to 50%. This gives you sufficient time to land your model safely. The telemetry facilities can also be used to set earlier alarm thresholds at the transmitter.

• **Excess current guard**

If the Peak Current is exceeded, the **iESC** switches the motor off, then restarts

the motor. If the Peak Current is exceeded a second time, the **iESC** switches off the motor completely. Possible causes include a burned-out motor.

7. SET CONTENTS

- 1x **iESC 65.8** or **125.8 V2**
- Instruction manual in German and English

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. It gives you the opportunity to obtain help quickly all round the clock – even at weekends. All the answers are provided by the **PowerBox Team**, guaranteeing that the information is correct.

Please use the Support Forum **before** you contact us by telephone:

www.forum.powerbox-systems.com



9. EU DECLARATION OF CONFORMITY

This device complies with the essential requirements and other relevant provisions of Directives 2011/65/EU + 2015/863/EU (RoHS) and 2014/30/EU (EMC). The EU Declaration of Conformity for the **PowerBox iESC 65.8** and **iESC 125.8 V2** can be found under the following link:

www.powerbox-systems.com/en/content/certificates

10. GUARANTEE CONDITIONS

At **PowerBox-Systems** we insist on the highest possible quality standards in the development and manufacture of our products. They are guaranteed **"Made in Germany"**!

That is why we are able to grant a **24 month guarantee** on our **PowerBox iESC** from the initial date of purchase. The guarantee covers proven material faults, which will be corrected by us at no charge to you. As a precautionary measure, we are obliged to point out that we reserve the right to replace the unit if we deem the repair to be economically unviable.

Repairs which our Service department carries out for you do not extend the original guarantee period.

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.

We accept no liability for transit damage or loss of your shipment. If you wish to make a claim under guarantee, please send the device to the following address, together with proof of purchase and a description of the defect:

SERVICE ADDRESS

PowerBox-Systems GmbH
Dr.-Friedrich-Drechsler-Str. 35
86609 Donauwörth
Germany



11. SAFETY INFORMATION FOR THE INTENDED USE OF THE POWERBOX iESC

a) General safety

- Read this user manual in full before use.
- Use the controller exclusively for its intended purpose with brushless electric motors in model-making.
- This product is not a toy. Keep children away from the product.
- Use only undamaged components and cables.

b) Risk of injury from rotating propellers

- Never work on the drive whilst the drive battery is connected.
- Remove the propeller or rotor blades during all adjustment, programming and testing work.
- Keep a safe distance from rotating parts during operation.
- Ensure that no persons or objects are within the danger zone.

c) Electrical safety

- Connect the controller only to batteries within the permissible voltage range.
- Never reverse the polarity of the supply voltage.
- Avoid short circuits on all connecting cables.
- Do not use damaged cables or plugs.
- Disconnect the drive battery from the controller after each use.

d) Cooling

- Ensure that the controller is adequately cooled.
- Do not cover the controller with foam or other heat-insulating materials.
- Do not operate the controller outside the permissible temperature range.

e) Commissioning

- Secure the controller firmly in the model, ensuring it is protected against vibrations.
- Before each flight, check that all plug connections are securely fixed.
- Check the direction of rotation of the motor before using it for the first time.
- Ensure that the throttle is set to idle when switching on. The integrated self-test checks, amongst other things, the motor, throttle position and supply voltage.

f) Operation

- Never exceed the permissible current, voltage and temperature limits.
- Use only suitable LiPo batteries and observe their safety instructions.
- Never operate the controller unattended.
- Stop operation immediately if unusual noises, odours or excessive heating occur.

g) Maintenance

- Do not open the housing. There are no components inside that require user maintenance.
- Clean the controller only when it is disconnected from the mains, using a dry cloth.
- Protect the product from moisture, dirt and corrosive chemicals.

h) Approval information

- This device complies with the requirements of Directives 2011/65/EU + 2015/863/EU (RoHS) and 2014/30/EU (EMC).
- When operating in other countries, the applicable national regulations and approval requirements must be observed.

i) Disposal

- This product must not be disposed of with household waste.
- Take the device to a suitable collection point for waste electrical and electronic equipment for proper disposal (observe the WEEE Directive).

12. LIABILITY EXCLUSION

We are not in a position to ensure that you observe our instructions regarding installation of the **PowerBox iESC**, fulfill 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 **PowerBox iESC**, 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 loads of fun with your new **PowerBox iESC**!

A handwritten signature in blue ink, appearing to be 'D. R.', followed by a small horizontal line.

Donauwörth, August 2026

PowerBox-Systems GmbH

Dr.-Friedrich-Drechsler-Straße 35
86609 Donauwörth
Germany



+49 906 99999-200



sales@powerbox-systems.com

www.powerbox-systems.com