PowerBox Systems®

*World Leaders in RC
Power Supply Systems*

POWERBOX
BASELOG

Dear customer,

We are delighted that you have decided to purchase the **PowerBox BaseLog** RC power supply unit from our range. We wish you every success with your new **PowerBox BaseLog**, and hope you have loads of fun with it.

1. PRODUCT DESCRIPTION

The **PowerBox BaseLog** is a modern power supply system containing all the electronic components required to power modern receivers, servos and models. All the components which are essential to a reliable power supply, i.e. ICs, micro-controllers and electronic circuits, are **duplicated**. The unit incorporates some of the latest electronic innovations, including a graphic OLED screen and the ability to transmit telemetry data from the **PowerBox BaseLog** to transmitters of various makes. The net result is that the unit provides unprecedented facilities for monitoring airborne batteries.
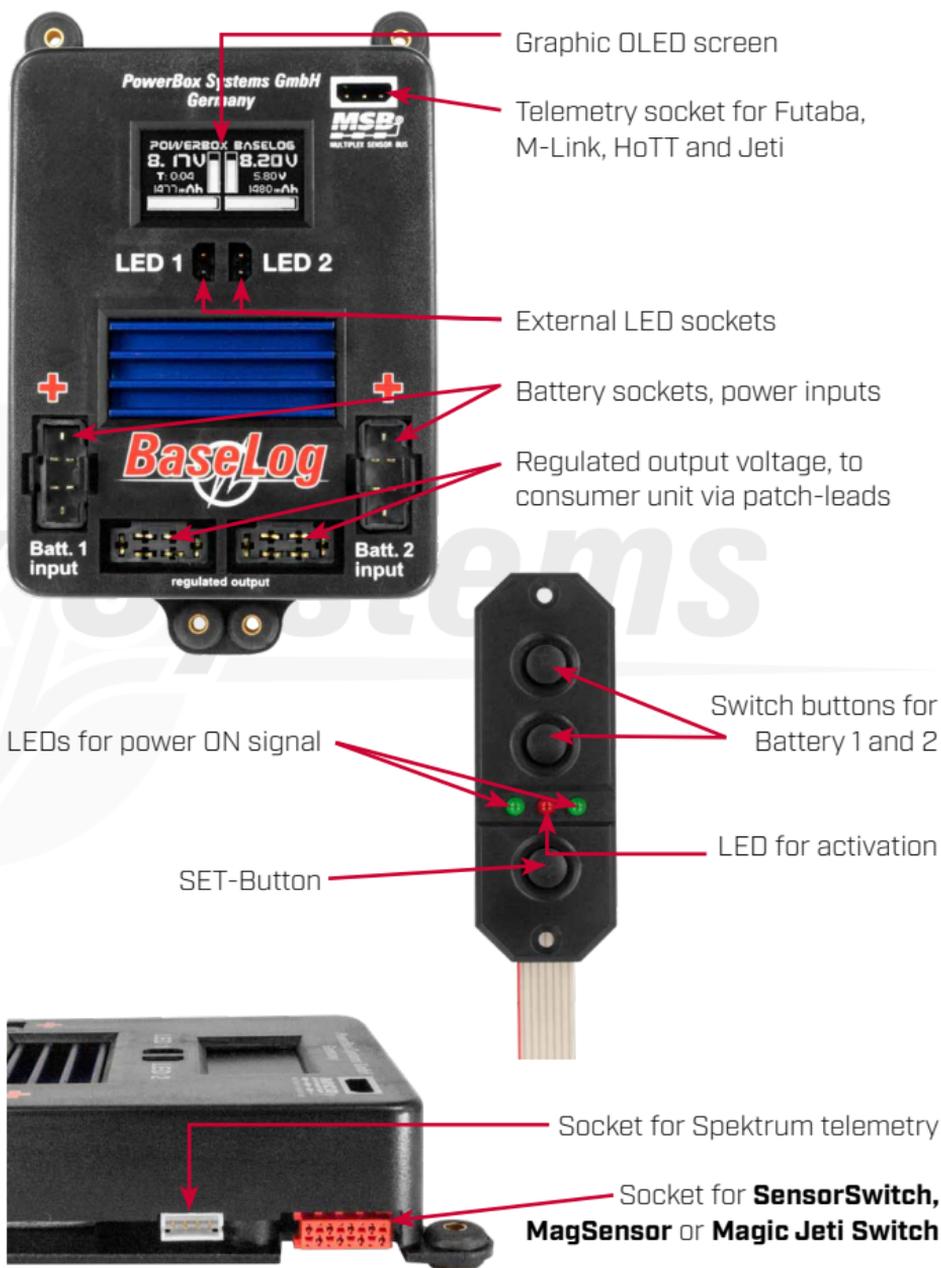
FEATURES:
+ Dual regulated output voltage
+ User-selectable output voltage of 5.9 V or 7.4 V, software-variable using the **SensorSwitch**
+ Informative graphic OLED screen with a resolution of 128 x 64 pixels
+ Facility for connecting Futaba*, M-Link, Spektrum, HoTT and Jeti down-link bus systems
+ Direct transmission of both batteries' voltage + capacity to the transmitter
+ Voltage display for each battery
+ Residual capacity display for both batteries
+ Minimum value memory for both batteries
+ Large heat-sink area for high regulator performance
+ Supports all currently used battery types: LiPo/LiIon, NiMH/NiCd, LiFePo
+ Suppression of possible servo feedback currents
+ Various patch-leads (MPX / JR / Futaba, MPX / MPX) available, allowing the use of all receiver types

This range of functions makes the **PowerBox BaseLog** the ideal battery backer for large model aircraft with wingspans in the range 2.0 m to 2.6 m, as well as for helicopters and gliders.

*with the **Teleconverter**, Order.No: 5600

2. CONNECTIONS, CONTROLS

The following illustrations show the essential sockets and controls:

Graphic OLED screen

Telemetry socket for Futaba, M-Link, HoTT and Jeti

External LED sockets

Battery sockets, power inputs

Regulated output voltage, to consumer unit via patch-leads

Switch buttons for Battery 1 and 2

LEDs for power ON signal

LED for activation

SET-Button

Socket for Spektrum telemetry

Socket for **SensorSwitch, MagSensor** or **Magic Jeti Switch**

3. FIRST STEPS, THE UNIT IN USE

a) Connections

- First connect the receiver to the **PowerBox BaseLog** using the two **genuine**, **PowerBox-Systems** patch-leads supplied in the set.
- If your model is fitted with a receiver featuring an MPX high-current input socket, use the MPX / MPX patch-lead for this connection; if you wish, the second socket can be plugged into any vacant servo socket on the receiver using an MPX / JR patch-lead.

CAUTION: if the receiver features an integral battery backer, connect both plugs to the servo sockets; this arrangement by-passes the receiver's battery backer function.

- Now connect the **SensorSwitch** to the appropriate socket on the unit, ensuring that the ribbon cable **faces up** as shown. In models subject to severe vibration we recommend that you secure the ribbon lead by at least one additional point to avoid any risk of the connector working loose. If the connector were to come adrift, it would have no effect on the switched state of the backer, but would prevent you switching the system off.
- If you wish, the optional ultra-bright external LEDs can now be connected to the unit. We urge you to connect them and mount them in the fuselage side, as they provide a useful visual warning of battery problems when the model is flying. This is particularly advisable if you are not using the unit's telemetry transmission facility.
- The final step is to connect the batteries to the backer's integral MPX sockets, taking care to **maintain correct polarity**. We recommend the use of the **PowerPak 2.5X2 ECO or PRO** or for larger models the **PowerPak 5.0X2 ECO or PRO**. If you prefer to use other makes of battery, or wish to make up your own packs, it is absolutely essential to maintain correct polarity. Connecting a battery with reversed polarity will instantly ruin the backer's regulator ICs. In order to minimise power losses, the backer does not feature reverse polarity protection. The **+** (positive) indicators are clearly marked on the case cover.
- The unit also offers a connection facility to radio control systems which support telemetry. If you wish to use this feature, be sure to connect the **PowerBox BaseLog** to the receiver or downlink transmitter **before** switching the system on.

b) The procedure for switching on and off

Switching the unit on and off is very simple, and the process effectively eliminates the danger of changing the backer's status accidentally. This is the procedure:

To switch on, locate the SET button on the **SensorSwitch** and hold it pressed in until the central LED glows red, indicating that the unit is now ready to be switched. Continue to hold the SET button pressed in while you press buttons I and II in turn; the backer is now switched on, with both batteries active. Repeat the procedure to switch off: hold the SET button pressed in, wait until the central LED glows red, then confirm by pressing buttons I and II in turn.

The **PowerBox BaseLog** stores (saves) the last switched state. This means that a backer switched off using the **SensorSwitch** remains switched off. Once switched on, the backer can only be turned off again using the **SensorSwitch**. Intermittent contacts or interruptions in the power supply **cannot cause the backer to be switched off.**

c) Entering battery data

No additional device is needed for entering further settings; all the values are entered using the **SensorSwitch** alone.
To ensure that the **PowerBox BaseLog** is always in a position to provide accurate information about the condition of the batteries, you must first enter the type, the nominal capacity and the output voltage of the packs you are using. This is the procedure:

- Switch on the **PowerBox BaseLog** with both batteries active.
- Hold the SET button pressed in for about five seconds until the screen changes to the menu shown below:

```
○CHEMISTRY: LiPo
 CAPACITY: 2800 mAh
 OUTPUT-
 VOLTAGE: 5.9V

 TELEMETRY        OK
```

The menu control system used by **PowerBox-Systems** is very simple and intuitive:

- Buttons I and II on the **SensorSwitch** are used to move the cursor up and down.
- Confirm your choice by pressing the SET button, and then adjust the selected value.

The cursor is now a solid white disc. Pressing button I or button II selects the available battery types in this sequence: *LiPo, NiMH, LiFePo*.

```
•CHEMISTRY: LiFePo
 CAPACITY: 3200mAh
 OUTPUT-
 VOLTAGE: 5.9V

 TELEMETRY        OK
```

Press the SET button to confirm your choice of battery type; this action also stores the selected type.

The cursor now appears as a hollow circle, and you can move on to the next menu point - *CAPACITY* - by pressing button II. When the cursor is located before *CAPACITY*, press the SET button to set the nominal capacity of the battery. The cursor turns solid again, and you can adjust the capacity using buttons I and II. It is also possible to hold buttons I or II pressed in if you want the value to change more swiftly.

Confirm your setting by pressing the SET button.

d) Setup output voltage

Press button II to move on to the next menu point: the output voltage for the **PowerBox BaseLog - *OUTPUT VOLTAGE***.

At this point you can set your preferred output voltage using buttons I and II.

> **CAUTION:** if you intend to set this value to 7.4 V, it is essential to check that all the consumer units connected to the system - servos, receivers, gyros, etc. - are also compatible with 7.4 V. You will find information on this subject in the instructions supplied with these components.
> Press the SET button to confirm your choice; this action also stores the setting.
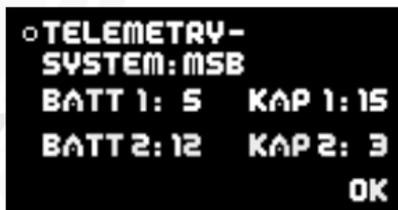
e) Telemetry settings

The **PowerBox BaseLog** includes an entirely new feature: you can connect different radio control systems to the unit, so that all the battery data is transmitted directly to your RC transmitter's integral screen. The unit supports the Futaba*, M-Link, Spektrum, HoTT and Jeti telemetry.

with the **Teleconverter, Order.No: 5600*

The unit outputs the battery voltage and residual capacity of both batteries. As an additional feature, alarms are triggered at the transmitter at a specific threshold, which varies according to the battery type. An alarm is also triggered at the transmitter when the residual capacity falls below 20%.

Regardless of the telemetry system you have chosen, selecting the *TELE-METRY* point in the main menu takes you to the following display:

```
○TELEMETRY-
  SYSTEM: MSB
  BATT 1: 5   KAP 1: 15
  BATT 2: 12  KAP 2: 3
                    OK
```

```
○TELEMETRY-
  SYSTEM: HOTT

                    OK
```

At this point you can select the telemetry system you wish to use.
Notes on the different telemetry systems:

- Multiplex MSB
  Choosing Multiplex MSB gives you the opportunity to change the sensor addresses to suit your requirements. Ensure that they do not clash with the addresses of other sensors connected to the bus (current, GPS etc.). Connect the battery backer's telemetry output to the receiver's sensor input using a standard Uni patch-lead.

- Spektrum
  Connect the four-pin Spektrum telemetry output to the TM1000, and bind the TM1000 and the receiver to your transmitter simultaneously.
  The lead required for this is available in various lengths from Horizon Hobby:

  SPMA9579X-Bus Extension 150 mm
  SPMA9580X-Bus Extension 300 mm
  SPMA9581X-Bus Extension 600 mm

- HoTT

 Connect the battery backer's telemetry output to the receiver's sensor input using a standard Uni patch-lead. Select the "Electric Air Module" in your transmitter's Telemetry menu.

- Jeti

 Connect the battery backer's telemetry output to the receiver's "Ext" input using a standard Uni patch-lead. You will now see "PowerBox" on your transmitter screen, and can arrange the four values on your screen.

f) Key to the Parameters display

Digital voltage display,
battery 1 and battery 2

Graphic voltage display,
battery 1 and battery 2

Time since the
last RESET

Set output voltage

Graphic display of
charge state,
battery 1 and 2

Minimum value memory

Digital display of
residual battery
capacity in mAh

- Digital voltage display:

 This extremely accurate display shows the voltage present at the battery backer's input.

-Graphic voltage display:

 The graphic display also allows you to see the momentary voltage of the batteries at a glance. The scale of the display is designed in such a way that the batteries should be recharged when the bar falls to the bottom third. If the vertical bars disappear completely, the model cannot be flown with safety.

- Minimum value memory:

 The minimum value memory takes the form of a narrow black horizontal bar in the graphic voltage display. This feature lets you see at a glance the extent to which battery voltage has fallen during the flight. If the voltage has collapsed to below half of the scale, this is a clear warning that you

should check your batteries, or use alternative, higher-performance packs. A collapse to this extent clearly indicates that the batteries are not "man enough" for the loads placed on them by your model, or by your flying style, or by the model's servos; the reason could be the effects of ageing, or your choice of unsuitable cells.

- Operating time:
The operating time is reset to 0 every time you carry out a consumption reset, i.e. capacity and time are always coupled together. This enables you to determine accurately how much capacity (in mAh) the airborne system has consumed during the displayed operating time.

- Graphic charge state display:
The scaling used for this display relates to the battery capacity you have entered, i.e. if only half of the bar is displayed, the battery is still half-full, and this charge state is correct for the battery type you have set.

- Digital residual capacity:
Provided that you have set the battery capacity correctly, and that the cells are technically in perfect condition, this display accurately shows the residual capacity of the pack.

- Output voltage:
Shows the voltage present at the backer's output.

g) Resetting the consumption display

The consumption display should be reset to "0" every time you recharge the batteries. This is the procedure:

Hold both buttons I and II on the switch pressed in until the following display appears on the screen:

Now release both buttons, and the consumption / time monitoring restarts at 0.

h) Regulator malfunction

The **PowerBox BaseLog** battery backer constantly checks both voltage regulators independently of each other. If a fault should develop in one of these regulators, the following warning will appear on the screen:

There are two possible causes for this warning:

a) One or both regulators is not generating an output voltage. This means that you could be flying the model with only one regulator working. For reasons of safety this is not recommended.
b) One or both regulators is not working, and is passing the full battery voltage through. This means that the servos and receivers are operating on excessive voltage, which in the long-term may lead to component failure.

If you see this error message, send the unit to us at the Service Department address, together with the repair form, duly completed.

4. SPECIFICATION

Operating voltage:	4.0 Volt to 9.0 Volt
Power supply:	2 x 5s NiMH/NiCd, 2s LiPo/LiIon, 2s LiFePo
Current drain,	Switched on: approx. 85 mA
	Switched off: approx. 10 μA
Max. output current:	Peak 2 x 20 A
Dropout voltage:	approx. 0.3 V
OLED screen resolution:	128 x 64 pixels
Bus Systems:	Futaba, Spektrum, Multiplex, HoTT, Jeti
Dimensions:	93 x 67 x 19 mm
Weight:	88 g
SensorSwitch:	15 g
Temperature range:	-30°C to +75°C
EMV approval:	EN 55014-1:2006
CE approval:	2004/108/EG
Registered design:	DE 203 13 420.6

This battery backer fulfils the EMV protective requirements, EN 55014-1:2006 with certificate dated 16 January 2010. EMC approval 2004/108/EG.

The unit must not be connected to a mains PSU!

5. DIMENSIONS
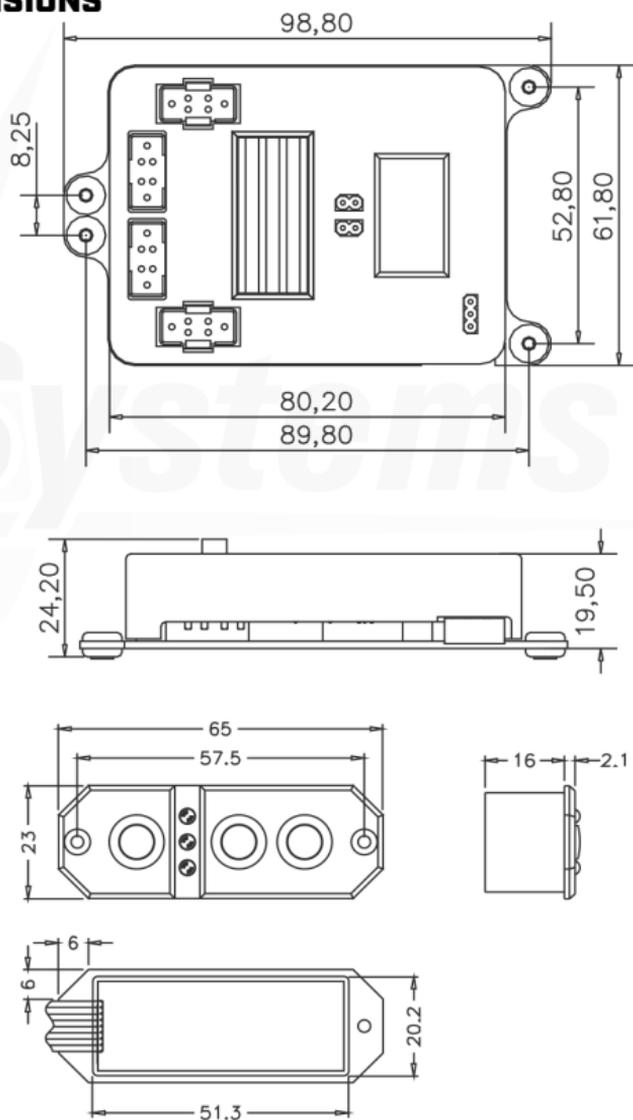
6. SET CONTENTS

- **PowerBox BaseLog**
- **SensorSwitch**
- Two PowerPatch-leads to choice: MPX / MPX or MPX / JR, Futaba
- Two external LEDs and holders
- Four rubber grommets and brass spacers, factory-fitted
- Four retaining screws
- Operating instructions in English and German

7. SERVICE NOTE

We make every effort to provide a good service to our customers, and have now established a Support Forum which covers all queries relating to our products. This helps us considerably, as we no longer have to answer frequently asked questions again and again. At the same time it gives you the opportunity to obtain assistance all round the clock, and even at weekends. The answers come from the **PowerBox team**, which guarantees that the answers are correct.

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

You will find the forum at the following address:
www.forum.powerbox-systems.com

8. 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 **36 month guarantee** on our **PowerBox BaseLog** 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 wish 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 deny any further liability, e.g. for consequent damage. We also deny liability for damage caused by the device or the use of the device.

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
Ludwig-Auer-Straße 5

D-86609 Donauwoerth
Germany

9. LIABILITY EXCLUSION

We are not in a position to ensure that you observe our instructions regarding installation of the **PowerBox BaseLog**, 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 **PowerBox BaseLog**, 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 **PowerBox BaseLog**.

Donauwoerth, october 2017

PowerBox-Systems GmbH
certificated according to DIN EN ISO 9001:2008

Ludwig-Auer-Straße 5
D-86609 Donauwoerth
Germany

📞 +49-906-99 99 9-200
🖨 +49-906-22 45 9

www.powerbox-systems.com