PowerBox Systems®

*World Leaders in RC
Power Supply Systems*

DIGISWITCH
SMARTSWITCH

Dear customer,

We are delighted that you have decided to purchase the **PowerBox DigiSwitch** or **SmartSwitch** from our range.
We hope you have many hours of pleasure and great success with your new power supply.

1. PRODUCT DESCRIPTION

The **DigiSwitch** or **SmartSwitch** is an excellent choice for any application where there is no space for mechanical switches and heavy batteries.
In conjunction with modern LiPo or LiFePo battery technology, the **DigiSwitch** or **SmartSwitch** represents an effective weight-saving measure, and also provides additional security with its integral voltage monitor and electronic switch, which is both totally reliable and vibration-resistant.

The **DigiSwitch** reduces the input voltage to 5.9 V (optionally 5.3 V), and therefore supplies the correct voltage for standard 6 V servos.
The **SmartSwitch** is ideal for all applications where security has top priority, but voltage regulation is not required. The micro-controller by which the On / Off switching system is controlled makes the **SmartSwitch** the perfect substitute for a mechanical switch.
The **SmartSwitch** does not feature an integral voltage regulator, and passes on the full input voltage to the consumer unit 1 : 1.

The on / off switching process is initiated by pressing the push-button twice. The micro-controller monitors the sequence, and turns the electronic switch on or off if the procedure is valid. This eliminates any danger of operating the switch acci-

dentally, and produces a connection which is resistant to vibration. The switch is a latching type, i.e. it stores the last switched state. This means that the system always remains switched on even if there is a brief interruption in the circuit at the battery end.

DigiSwitch applications:
- Small to medium-sized fixed-wing model aircraft with up to five standard-sized servos
- F3A models
- Model gliders with up to eight servos, depending on servo size and model size
- Model helicopters - electric or glow-powered - with rotor diameters up to 1.30 m and fitted with up to five servos
- RC model cars and boats
- Petrol engine ignition systems which are approved for a maximum input voltage of 6 V (DA, DLE)

SmartSwitch applications:
- Small to medium-sized fixed-wing model aircraft with up to eight standard-sized servos
- F3A models
- Model gliders with up to ten servos, depending on servo size and model size
- Model helicopters - electric or glow-powered - with rotor diameters up to 1.60 m and fitted with up to seven servos
- RC model cars and boats
- Petrol engine ignition systems which are approved for a maximum input voltage of 8.4 V (3W)

In the following sections we do not differentiate between the **DigiSwitch** and **SmartSwitch**, since the method of operating the two units is identical.

2. FIRST USE, OPERATING THE SWITCH

2.1. CONNECTIONS

Connect a battery of your choice to the battery input, taking care to maintain correct polarity. This can be a 4S (**SmartSwitch** only) or 5S NiCd / NiMH battery, a 2S (7.4 V) LiPo / Li-Ion or a 2S (6.6 V) LiFePo pack.

By default the voltage monitor is set up to work with a LiPo battery.

We recommend that you use the LiPo or LiFePo battery packs which we manufacture. All **PowerBox batteries** are equipped with appropriate electronic monitor and security circuits, balancer and integral charger. All our batteries are supplied complete with a practical mounting frame of the correct size.

CAUTION: connecting the battery with reversed polarity will instantly ruin the integral linear regulator!

2.2. SWITCHING ON AND OFF

The **Digi-** and **SmartSwitch** features a single button, and is therefore particularly user-friendly; this button is even employed to set the battery type to be used. The button transmits the switching signal to the electronic switch, but has nothing to do with the actual process of switching the current.

The unit is switched on by pressing the sensor button (0.5 sec.), and holding it pressed in until the LED glows orange. Release the button briefly, then press it a second time. The LED now glows green, and the unit is switched on.

The procedure for switching off is identical: press the sensor button (0.5 sec.) and hold it pressed in until the LED glows orange. Release the button briefly before pressing it a second time: the LED now goes out, and the unit is switched off.

This two-stage switching procedure eliminates the danger of switching the system on or off accidentally.

If the LED glows orange or red instead of green when you switch the unit on, then:
- the battery connected to the unit is flat or only partially charged
- the unit is set up for the wrong type of battery.

2.3. SETTING THE BATTERY TYPE

If you wish to use a 4s/5s NiCd or NiMH battery, or a 2s LiFePo pack, it is essential to set the voltage monitor to match your choice, otherwise the LED with flash red constantly. Please note, however, that the setting has absolutely no effect on the actual switching process or the voltage regulation system.

This is the procedure for setting up the unit to suit the different battery types:

DigiSwitch:
- Connect the battery, and switch on the **DigiSwitch**
- Now hold the button pressed in, and watch the LED
- The LED will glow red, then go out again after a while
- Pause, hold the button pressed in again
- The LED flashes green once. If you release the button now, you have selected the 2s LiPo battery type
- Pause, hold the button pressed in again

- The LED flashes green twice. If you release the button now, you have selected the 5s NiCd/ NiMH battery type
- Pause, hold the button pressed in again
- The LED flashes green three times. If you release the button now, you have selected the 2s LiFePo battery type

SmartSwitch:
- Connect the battery, and switch on the **SmartSwitch**
- Now hold the button pressed in, and watch the LED
- The LED will glow red, then go out again after a while
- Pause, hold the button pressed in again
- The LED flashes green once. If you release the button now, you have selected the 2s LiPo battery type
- Pause, hold the button pressed in again
- The LED flashes green twice. If you release the button now, you have selected the 5s NiCd/ NiMH battery type
- Pause, hold the button pressed in again
- The LED flashes green three times. If you release the button now, you have selected the 4s NiCd/ NiMH battery type
- Pause, hold the button pressed in again
- The LED flashes green four times. If you release the button now, you have selected the 2s LiFePo battery type

This procedure does take a few seconds, but is designed to prevent the user setting the wrong battery type accidentally. In any case it only has to be carried out once when you switch battery types; the setting is stored permanently in the micro-controller.

2.4. VOLTAGE MONITOR

The **Digi-** or **SmartSwitch** not only regulates the operating voltage of your RC system, it also monitors the battery connected to it.

The tri-colour LED, which you have already used to confirm the unit's power-on status, also informs you of the voltage of your battery by changing colour. The four stages are reflected by the colours green, orange, red and flashing red. Before you launch your model, you should always switch the RC system on and move the sticks around briefly: this gives you the chance to check whether the system is "in the green" while the battery is actually under load. The coloured LED also acts as a warning if the battery is too small to cope with the servos in your model, or if the battery cables are of inadequate cross-sectional area.

2.5. INSTALLATION

Please don't throw away the internal packaging, as it includes a cutting template for marking out the switch opening in or on the model.

Although the product is well protected against the effects of vibration, you should still install it in a part of the fuselage where vibration levels are low.

The GRP fuselage sides of a powered model aircraft are not suitable for mounting a switch - regardless of type - because they always tend to oscillate and vibrate. You can eliminate this problem by fitting a doubler made of 2.5 or 3 mm plywood: cut a plate 2 to 3 cm larger all round than the switch cut-out, and glue it to the inside of the fuselage at the appropriate point before sawing out the switch opening.

The plywood plate helps to absorb vibration, and also provides sufficient material for several turns of the switch retaining screws to "grip".

3. OPERATING NOTES

If the battery is left connected to the **Digi-** or **SmartSwitch** when it is switched off, the microprocessor goes into stand-by mode; in this state it draws a minimal idle current of around 5.0 µA, which is far lower than the self-discharge rate of any rechargeable battery.
Nevertheless, it is good practice to disconnect the battery from the unit if you know you will not be flying the model for a protracted period.

We are frequently asked this question: how much current can the **DigiSwitch** or **SmartSwitch** handle? Here is a comprehensive explanation:

DigiSwitch:
The capacity of the **PowerBox DigiSwitch** (1 - 3 A) is limited by the performance of the regulator when cooled efficiently, rather than by the switching capacity of the **DigiSwitch**. To obtain good cooling and ensure high performance, one of the heat-sinks of the **DigiSwitch** is attached to the outside of the unit. This part is normally installed on the model's fuselage side, where it receives a constant flow of cooling air when the model is flying. The internal silver-coloured heat-sink is soldered to the regulator circuit board due to its greater ability to withstand high temperatures. The maximum current-handling capacity of the electronic components is 12 A; this means that the unit can cope with brief peak loads up to this level without problem.

If the **DigiSwitch** is operated on a 5S NiCd or a 2S LiFePo battery, the maximum regulator capacity is higher because of the lower voltage level of these cells.

If you find that the **DigiSwitch** heats up to an uncomfortable level (above 60°C) in use, then it is a safe assumption that the load connected to it is too great. You can usually improve the situation by installing the **DigiSwitch** in a position where the cooling airflow is better, and also by reducing any stiffness in the control surfaces or mechanical linkages. If none of these measures eliminates the problem, you should replace the unit with a **PowerBox Sensor**, as this product is designed for higher currents. We will be glad to advise you on such matters.

SmartSwitch:
The **SmartSwitch** requires no cooling in operation. The switching capacity is more than 20 A, and in practice the limiting factor is the connecting cable.

As already mentioned, the **SmartSwitch** is not fitted with a voltage regulator, and for this reason it does not constitute a means of operating standard 6 V servos with LiPo batteries.

4. DIMENSIONS

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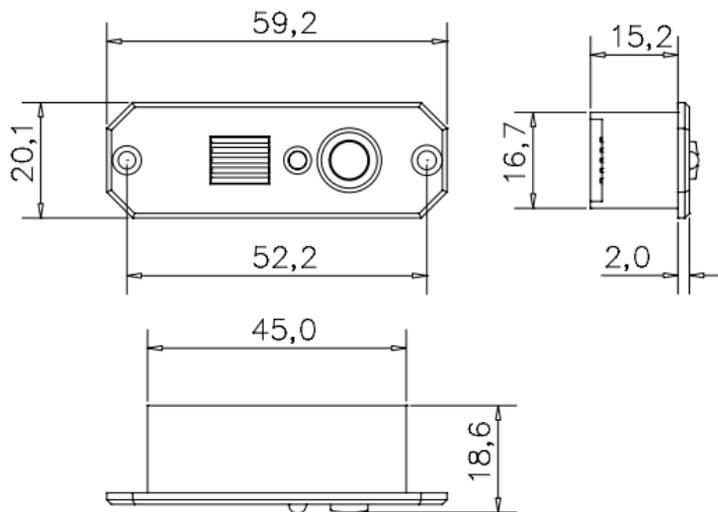
5. SET CONTENTS

- **DigiSwitch/SmartSwitch**
- Retaining screws
- Installation template
- Operating instructions

Order No. 6410: Digiswitch 5,9V JR/JR Connector
Order No. 6420: Digiswitch 5,9V MPX/2xJR Connector

Order No. 6510: SmartSwitch JR/JR Connector
Order No. 6520: SmartSwitch MPX/2xJR Connector

6. SERVICE NOTE

We are anxious to offer good service to our customers, and to this end we have set up a Support Forum which deals with all queries concerning our products. This relieves us of a great deal of work, as it eliminates the need to answer frequently asked questions time and again. At the same 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 telephone us.

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

7. 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 Digi-Switch** and **SmartSwitch** 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
Ludwig-Auer-Straße 5
D-86609 Donauwoerth
Germany

8. LIABILITY EXCLUSION

We are not in a position to ensure that you observe our instructions regarding installation of the **PowerBox DigiSwitch** or **SmartSwitch**, 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 DigiSwitch** or **SmartSwitch**, or which are connected with such use in any way. Regardless of the legal arguments employed, our obligation to pay compensation 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 with your new **PowerBox DigiSwitch** or **SmartSwitch**.

Donauwoerth, July 2017

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

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