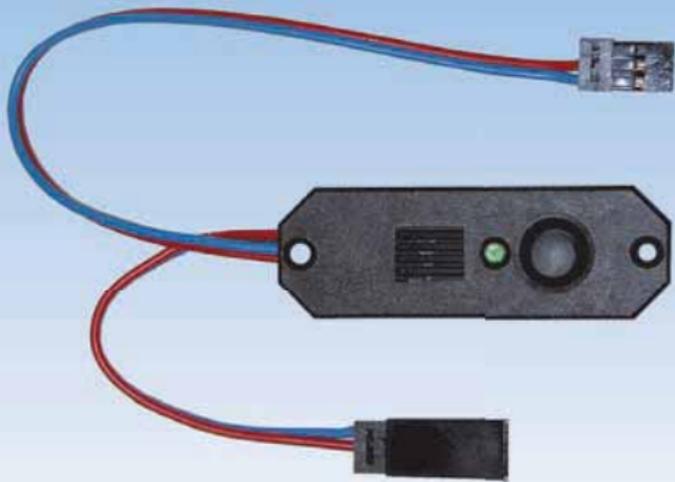


**PowerBox Systems**

World Leaders in RC  
Power Supply Systems

**Instruction Manual**

# *DigiSwitch*





***PowerBox Systems***

**Dear customer,**

Congratulations on your decision to purchase the **DigiSwitch** from our range.

This innovative product was the world's first multi-function switch system, developed and produced by **PowerBox Systems GmbH**. Designed specifically for use with modern, lightweight Lithium-Polymer cells, the unit provides a substantial improvement in switch security for receiver power supplies. The robust housing incorporates a modern, self-latching electronic switch, a high-performance linear IC-controlled voltage stabilisation circuit and a four-stage voltage monitor designed for use with a two-cell LiPo battery or a five-cell NC / NiMH pack.

**Important constructional features:**

Ultra-robust plastic housing (30% glass fibre content), dual connecting leads with a conductor cross-section of 0.34 mm<sup>2</sup>, silicone leads soldered directly (i.e. in a straight line) to extra-wide solder pads, where they are encapsulated in a special support adhesive for additional protection from possible vibration damage. Circuit board of SMT construction, program-controlled switching process, two heat-sinks, one of them soldered to the circuit board.

We recommend the **DigiSwitch** for the following **applications and types of model:**

- Small to medium-sized model aircraft with up to five standard-sized servos
- F3A models - for which it is an extremely popular solution
- Gliders fitted with up to eight servos or more, according to servo size, model size and type of flying (thermal flying or aerobatics)
- Helicopters, electric or glow-powered, with a rotor diameter of up to 1.30 m and a maximum of five servos
- RC cars - electric or glow-powered
- Model boats
- Ignition systems for petrol engines designed to be operated on the voltage of a four-cell NC battery (DA and many others)

## Operation:

The only control on the **DigiSwitch** is the push-button, which makes it extremely easy to operate. This button is also used to set the switch to the battery type you wish to install. In normal use all this button does is pass the switching signal to the electronic switch; the button itself has nothing to do with the actual switching of the current.

Connect a two-cell (8.40 V) Lithium-Polymer battery **or a five-cell NC / NiMH battery** to the battery lead, which is fitted with a polarised Universal connector. Take care to connect the pack **with correct polarity**.

**Caution: connecting a battery with reversed polarity will destroy the integral regulator IC contained in the switch.**

The LED immediately lights up when you connect the battery, and indicates the voltage of the pack: green is o.k., orange is half-discharged, and red is flat. The self-latching electronic switch is always in the “ON” position by default when a power source is connected to it. It must be switched off deliberately, using a defined process.

If you wish to switch the switch on with a power source connected, this must also be carried out using the specified defined process. So much for the explanation.

To switch the circuit off, hold the sensor button pressed in for about 0.5 seconds. The LED now glows orange. Immediately press the button a second time briefly. The LED goes out, and the **DigiSwitch** is switched off.

To switch the circuit on, hold the sensor button pressed in until the LED glows orange (0.5 sec.). Immediately press the button a second time briefly. The LED now glows green, and the circuit is switched on.

The process of pressing the button twice, with a precisely defined interval, completely eliminates the possibility of the switch being turned off accidentally, e.g. by vibration.

If an irregularity occurs when the circuit is switched on, e.g. if the switch overheats, a component fails, an intermittent contact is present in the connecting lead or battery, or if the previous power-off process was not carried out correctly, the program might switch into safety “Hold” mode. If this should happen, the **DigiSwitch** always remains switched on.

However, the circuit cannot now be switched off using the sensor button.

In this case please disconnect the power source from the DigiSwitch for a period of at least thirty seconds. The program will restart when you connect the battery again, and the switching function will then operate normally.

If this should occur repeatedly, please check the condition of your battery.

### **Setting the voltage monitor to the battery type in use:**

**The default setting is for LiPo or Li-Ion battery.** If you are using one of these battery types, you do not need to change any settings.

Connect the battery you wish to use; the **DigiSwitch** must be switched on.

The sensor button is used to set the switch to the battery type you are using.

Before you set this parameter you only need to note two points:

- One green flash means LiPo / Li-Ion
- Two green flashes means NC / NiMH, or a two-cell “123” battery

Hold the sensor button pressed in until the indicator stated above appears:

- The LED glows orange
- The LED flashes green once; release the button: the switch is now set to LiPo / Li-Ion
- Alternatively wait until the LED flashes green twice, then release the button: the switch is now set to NC / NiMH

That's all there is to it.



All the members of the Italian National F3A Team use the DigiSwitch in their models.

Sebastiano Silvestri took a splendid 3rd place at the 2006 European Championships in Switzerland using a DigiSwitch.

In Switzerland around 75% of all the F3A models were equipped with DigiSwitches.

At the 2007 World Championships in Argentina "Seba" achieved 5th place: his best performance yet.

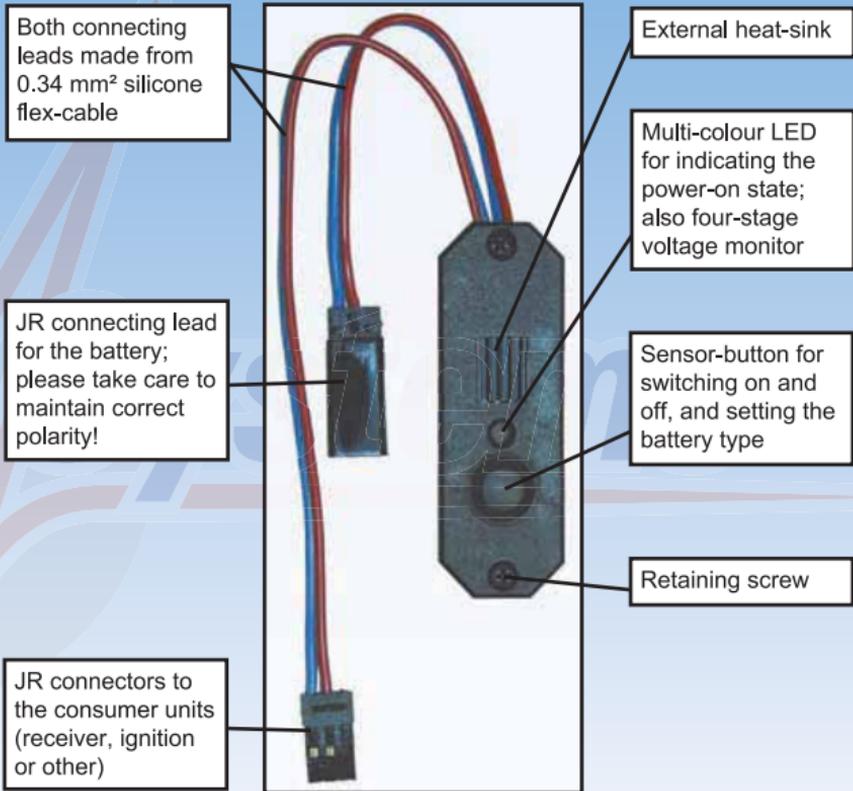


Successful pilots place their faith in the DigiSwitch: 1st, 2nd and 3rd places at the 2006 European Championships in Switzerland using the DigiSwitch.

The pilots were: Christophe Paysant Le Roux, Roland Matt and Sebastiano Silvestri!

The integrated voltage stabilisation circuit offers a very high performance, ensuring that the servos' running characteristics are totally constant. The torque and transit speed of the servos always remains absolutely identical through all manoeuvres.

This is an important pre-condition for successful aerobatics.



The current handling capacity of the **DigiSwitch** stated in the Specification is 1 - 3A, but this does not relate to the switching capacity of the **DigiSwitch**; in fact it refers to the capacity of the regulator when efficiently cooled. To ensure that the unit is cooled effectively, and is therefore able to deliver its full performance, we have attached one of the heat-sinks to the outside of the **DigiSwitch**. The switch is normally installed in the outside wall of the model, and this heat-sink is therefore constantly subjected to a steady flow of air when the model is in flight. The silver-coloured internal heat-sink is soldered to the regulator circuit board for maximum heat transfer. The heat-sink is mounted in a recess in the housing which ensures that it is not covered completely even if the switch is installed imperfectly. The electronic components are designed for up to 12 A. The DigiSwitch does not switch the circuit off if this level is exceeded; instead the current is switched through, by-passing the regulator.

If the **DigiSwitch** should become very hot in use (above 60°C), you can safely assume that the servos installed in the model are consuming a disproportionate amount of energy. The first remedy should be to install the **DigiSwitch** in a different position in the model, where it is subject to a more effective cooling airflow. If this is not sufficient, you should consider installing our **PowerBox Sensor**, which is designed to cope with higher currents.

The circuit is **not** switched off even if the battery voltage falls below the regulator voltage! The remaining available voltage is always passed through. The electronic circuitry continues to work down to below 2.5 Volts!

If you leave the **DigiSwitch** connected to the LiPo battery when it is switched off, then the unit goes into “**stand-by**” mode. The idle current in this state is around 5.0 micro-A, which is lower than any battery’s natural rate of self-discharge. Even so, we recommend that you disconnect the battery from the switch if you know the model will not be used for a long period.

## Voltage monitor:

The **DigiSwitch** does more than simply regulate the operating voltage of your RC system to a permissible level: it also monitors the battery connected to it.

The three-colour LED - which you have already used to confirm the power-on state - also keeps you informed about the voltage of the battery.

The LED displays the colours green, orange, red and flashing red in order to give you an idea of the voltage curve of the battery. Before launching the model, turn the RC system on and "stir the sticks" to check whether the battery remains "in the green" when under load. This will also show if the battery is not suitable for the servos installed in your model, and can also be a pointer towards inadequate conductor cross-section in the battery leads.

**This display can be trusted: please believe what it tells you!**



Please don't just throw away the inner packaging, as it is designed to be used as a template for marking the switch aperture on the model. Cut the opening using a knife or saw, working slightly outside the marked line (see photo).

Even though our product is very well protected from the effects of vibration, the **DigiSwitch** should always be mounted in a part of the model where vibration levels are relatively low.

### Please note the following point:

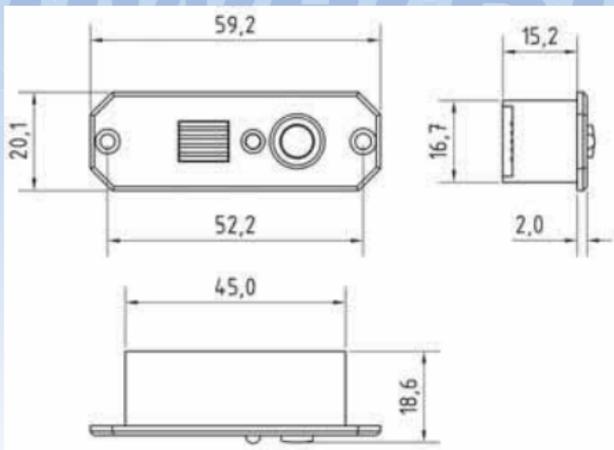
The GRP fuselage sides of a large power model are not suitable for mounting the **DigiSwitch** - nor any other type of switch - as they are always subject to considerable vibration.

You can remedy the situation by cutting a ply plate (2.5 - 3 mm thick) about 2 - 3 cm larger than the switch aperture, and gluing it over the inside of the opening.

The plate damps the vibration, and at the same time provides plenty of "meat" for the switch retaining screws to bite into.

For your receiving system power supplies we particularly recommend **our own make of batteries**: the **PowerBox Battery 2800** or **PowerBox Battery 1500**. These packs feature an integral electronic monitor / security circuit to ensure reliable charging. They are supplied complete with a practical mounting frame.

### Installed dimensions:



### Guarantee conditions:

During the production process each **DigiSwitch** undergoes a series of tests. We take the maintenance of high quality standards very seriously, and this includes bought-in items. That is why we are able to grant a **36 month guarantee** on all our battery backer and switch systems. The guarantee covers proven material faults, which will be corrected by us at no charge to you.

Misuse and maltreatment, such as reversed polarity connections, excessive voltage, damp, external mechanical influences or damage (crash damage) or inappropriate mounting (serious vibration) invalidate the guarantee.

The guarantee does not cover any additional claims, such as consequent damage. We do not accept liability for damage which is caused by the unit or its use, because we are unable to ensure that it is installed and operated in accordance with our instructions.

### Specification:

Voltage range:	Two-cell LiPo battery, max. 8.40 Volt Five-cell NC / NiMH battery, approx. 6.8 Volts
Output voltage:	5.50 Volts stabilised (corresponding to a four-cell NC battery)
Voltage monitor:	Three-colour LED Four stages: green, orange, red, flashing red
Regulator capacity:	1 - 3 Amps, according to cooling efficiency
Connectors:	JR plug and socket
Cable cross-section:	Both connecting leads 0.34 mm <sup>2</sup> , silicone flex-cable
Control component:	Sensor button
Weight:	15 grammes, including cables
Temperature range:	- 10° C to + 75° C

**Accessories:**

- \* Retaining screws
- \* Installation template

**Order No.: 6410**

We wish you every success using your new **DigiSwitch!**

**PowerBox**

Donauwörth, January 2008

*E. Mutschler*



***PowerBox Systems***



**PowerBox Systems**

*World Leaders in RC  
Power Supply Systems*

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