PowerBox Systems®

*World Leaders in RC
Power Supply Systems*

SPARKSWITCH RS

The **SparkSwitch RS** is a compact, high-performance ignition switch featuring rotational speed (RPM) monitoring and optional voltage regulation for 6V ignition systems. The **SparkSwitch RS** enables the user to switch the ignition on and off conveniently from the transmitter. The switched state can be checked at any time using the external LED or a telemetry status message. These features of the **SparkSwitch RS** enhance operating safety as well as simplifying the handling of petrol engines. In an emergency - such as the failure of a throttle servo - the **SparkSwitch RS** can be used to stop the engine quickly.

An important feature is galvanic separation between the receiving system and the ignition system. The switching process as well as RPM feedback from the ignition unit are optically isolated from the receiver. This ensures that a fault in the ignition system shielding, or any other defect, cannot cause interference to the sensitive receiving system.

The RPM (rotational speed) monitor input can be connected directly to the Tacho output of the ignition unit - if present. If your ignition system does not include a Tacho socket, we can supply a separate sensor which can be connected in parallel with the Hall sensor. The RPM data can be transferred to any of the current telemetry systems: the **SparkSwitch RS** automatically detects the system in use, eliminating the need for adjustments using the USB interface.

The **SparkSwitch RS** can be supplied in either of two variants: with or without voltage regulation. The regulated variant reliably reduces the input voltage (max. 9.0V) to 6.0V. The version without voltage regulation passes the full voltage (max. 13.0V) through.

Features

• Optical separation between the receiving system and the ignition system
• External LED switch status indicator
• Regulated (6.0V) or pass-through output voltage
• RPM monitor for all current telemetry systems
• Telemetry function for PowerBox, Jeti, Futaba, Graupner, Multiplex, Spektrum, JR
• Failsafe mode
• Machined aluminium heat-sink
• Compact, low-profile format

1. CONNECTIONS

The connections are clearly labeled on the **SparkSwitch RS**; the following describes them in detail:

PWM/BUS:
The **PWM** socket is not needed if you are using a PowerBox, Jeti, Futaba or Spektrum radio control system, as the **SparkSwitch RS** receives its switching information directly via the telemetry servo bus. By default the **SparkSwitch RS** is set to channel 12 for switching the ignition on and off. With these systems all you have to do is connect the unit to the receiver using a patch lead.
All other systems require two patch leads: one connection to switch the SparkSwitch, and one for the telemetry.

• **PowerBox P²-BUS**: connect the *BUS* input to the P²-BUS on the receiver
• **Jeti Ex-BUS**: connect the *BUS* input to an EX-BUS output on the receiver
• **Futaba S.BUS2**: connect the *BUS* input to S.BUS2 on the receiver

- **Spektrum SRXL2**: connect the *BUS* input to SRXLS2 on the receiver
- **Graupner, Multiplex**, **JR** and other systems: connect the **PWM** input of the **SparkSwitch RS** to a servo socket on the receiver. The *BUS* input of the **SparkSwitch RS** should also be connected to the receiver's telemetry output.

Battery
Connect the ignition battery to this socket. The centre pin is *Positive*, both outer pins are *Negative*. This arrangement eliminates the possibility of reversed polarity even if you connect the plug the wrong way round (turned through 180°).
It is essential to use a separate battery for the ignition system. Do not take the current from the receiver power supply, as this would negate the galvanic separation of the two power circuits.

Ignition
Connect the ignition unit to this socket. The centre pin is Positive, both outer pins are Negative. This arrangement eliminates the possibility of reversed polarity even if you connect the plug the wrong way round (turned through 180°).

RPM
If your ignition unit features a Tacho output, then it can be connected directly to this socket. For other ignition systems a separate sensor is available which derives the rotational speed from the Hall sensor. The RPM output also provides power to external sensors, which means that other types of rotational speed sensor - such as optical systems - can also be connected.

LED
The external LED is connected directly to the power output for the ignition unit, and is therefore a reliable indicator of the switched status.

2. SETTINGS AT THE TRANSMITTER

You must assign a dedicated channel at the transmitter for switching the ignition switch. The travel of the switched channel at the transmitter should be -100% to +100%; the switching threshold is located at around +50%.

If you are using a system which supplies the switching signal via the telemetry bus (PowerBox, Jeti, Futaba and Spektrum), the simplest method is to use channel 12, as this is the default setting on the **SparkSwitch RS**.

If this channel does not conform to your preferred transmitter layout, you can change the channel from the transmitter if you use a PowerBox (Telemetry menu) or Jeti (JetiBox MX) user. If you use a Futaba or Spektrum system, you can change the channel using **PowerBox Terminal** and the USB Interface.

If you are using a Multiplex, Graupner or JR system, simply connect the PWM output to the assigned channel at the receiver.

No other settings have to be changed, as the **SparkSwitch RS** detects the telemetry system automatically.

3. INSTALLATION

Install the **SparkSwitch RS** close to the ignition unit. Under no circumstances install the unit close to the receiver. The cables to the ignition unit should be as short as possible, and should not be bundled together with other cables which feed into the receiving system - such as the throttle servo lead.

In contrast, the cables to the receiver can be any length you like, as they are "clean" thanks to the optical isolation from the ignition system.

4. IGNITION BATTERY

Any type of ignition battery can be used: LiPo, LiIon and LiFe up to 3S, 8S NiCd or NiMh. **When connecting the battery, it is essential to maintain correct polarity! Reversed polarity will destroy the electronics in the SparkSwitch RS**.

The regulated version of the **SparkSwitch RS** incorporates an integral regulator which basically limits the voltage to 6.0V. This makes the **SparkSwitch RS** suitable for all ignition units whose label states 4.8V and 6.0V.

The unregulated version passes the full, unregulated input voltage (max. 13V) through, with low losses.
This means: if you connect a 2S LiPo, the ignition unit is fed a voltage of up to 8.4V; with a 3S LiPo it is up to 12.6V.

The ignition battery can be left permanently connected to the **SparkSwitch RS**. The current drain when switched off (1 μA) is so low that the battery will not be discharged even over a period of months.


5. RPM DIVIDER / MULTIPLIER

Depending on the type of RPM sensor you are using, it may be necessary to set up a divider or multiplier to obtain the correct rotational speed. PowerBox (Telemetry menu) and Jeti (JetiBox) users can set this directly from the transmitter; other systems require these settings to be changed using Terminal and the USB Interface.

6. SET CONTENTS

• 1x **SparkSwitch RS**
• 2x patch lead, 3-core
• 1x external LED
• 1x self-adhesive pad
• 1x operating instructions

7. DIMENSIONS
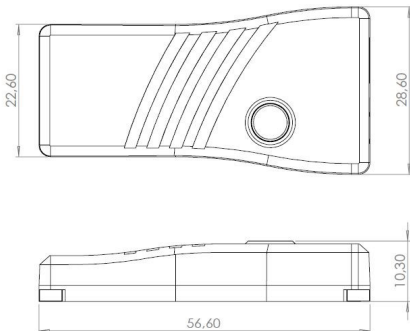
8. SERVICE NOTE

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, and 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 will find the forum at the following address:

www.forum.powerbox-systems.com

9. 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 grant a 24 month guarantee on the **SparkSwitch RS** 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.

SERVICE ADDRESS

PowerBox-Systems GmbH
Ludwig-Auer-Straße 5
86609 Donauwoerth
Germany

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 further claims, e.g. consequential damage. We also deny liability arising from the equipment or the use of the same.

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

10. LIABILITY EXCLUSION

We are not in a position to ensure that you observe our instructions regarding installation of the **SparkSwitch RS**, 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 **SparkSwitch RS**, 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 using your new **SparkSwitch RS**.

Donauwoerth, May 2023

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