Modellbau • Deutsch

The Modelling Expert

Operating Instructions

POWER BOX 40/24
"Professional"

The Dual-Power-Control System

Featuring six servo-pulse amplifiers plus
two independent voltage-controllers

Dear Customer,

We are very pleased that you have decided to purchase our **POWER BOX 40/24.** With this newly developed product you now have a powerful **Dual-Power-Control** system for your valuable model aeroplane. This will allow you to have not only the extra safety advantage of coupling two on board flight battery-packs. But to also have permanent control of the momentary voltage of each battery-pack. Furthermore this latest **Dual-Power-Control** unit also includes one powerful servo-amplifier for each of the six receiver-channels. This special feature will enable you to connect several servos to each receiver line out.

Although this new **Dual-Power-Control** unit is extremely easy to handle you will need to have some knowledge for it's correct use. This comprehensive manual will therefore help you to quickly familiarise yourself with your new accessory.
However, in order to fully understand the advantages and safety features of this unit all we ask is that you carefully read this manual right through before you commence using your new **Dual-Power-Control**. We sincerely hope you'll enjoy the many safety features we have built into your new **POWER BOX 40/24**.

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1. Function of the Dual-Power-Control

The **POWER BOX 40/24** is a **Dual-Power-Control** system which besides it's main function of being a power control unit – it also displays the momentary voltage of both of the two connected battery packs by a line of 5 ultra bright LEDs. Therefore you are always able to check the exact voltage of the two battery packs. This feature allows you to continually check if there's enough energy left in either of your two battery packs for another long thermic-flight. It is also possible to connect an extra bright LED to each battery -pack, which can be installed on the side of the fuselage. This offers you the possibility to check your battery-packs during flight.

In addition, you can also connect up to six servos covering the six most important channels of your model-aeroplane to the **Dual-Power-Control without** causing any problems. This is because the servo-pulses for each of the six channels connected are correctly amplified by a powerful precise on board operational amplifier, which special feature allows you to use extra long servo extension wires of up to 2:metres between the servos and the receiver without causing the servos any problems.

Furthermore our **POWER BOX 40/24** "Professional" version has automatic voltage regulation ensuring accurate receiver-voltage at all times. So even if you use two battery-packs with a high capacity, and perhaps charged with a higher voltage. The automatic stabilisation circuitry will protect your receiver(s) from this over voltage. The built in voltage-stability control ensures that the receiver(s) will not receive a voltage higher than 5:V. Therefore your receiver(s) will always have the exact voltage matched to the specifications of your receiver. Two 'Very low drop' fixed voltage controllers with an output amperage of 1:5 A. 3 A are provided to ensure that automatic stabilisation looks after the supply to your receiver(s).

Please note that only servos connected to the receiver directly are supplied with voltage via the fixed voltage controller. The servos you connect to the **POWER BOX 40/24** will get their power via the **Dual-Power-Control** from both battery-packs. The advantage of this method is that the receiver isn't connected with the high currents of the servomotors. If you connect several servomotors to one channel via V-cables, there is a possibility that your receiver's contacts maybe overloaded! Also the PC track in a receiver might not have the right dimension either. Our **POWER BOX 40/24** Professional disperses the six most important channels. Therefore this problem cannot occur when you use our **POWER BOX 40/24** Professional.

It is necessary to decouple the two battery packs. This is provided by a very powerful **Dual-Schottky-Diode.** Here, the two diodes are in one package. This new type of diode allows only minimal voltage drops. Therefore it is absolutely safe to use the **Dual-Power-Control** with battery packs made up of four cells only.

The **POWER BOX 40/24** operates with two battery-packs of the same size and voltage; this then means that both battery-packs get discharged steadily. While operating it's always the battery with the highest momentary voltage, which will be stressed. Therefore both battery-packs must have the same number of cells and must also be of the same capacity. So it's important that you only use two identical capacity battery-packs.
During flying you can use the whole capacity of both battery-packs. When one battery-pack diminishes to the pre-set level the second one will immediately cut in to provide the necessary power-supply for the receiver and servos. By using our **High-Current-switches** along with our double cable circuitry we provide you maximum flight security.

The **POWER BOX 40/24** is also equipped with two independent voltage-controllers in order to check the voltage of both sources of energy. Five coloured LEDs display the momentary voltage of each battery-pack: 3-Green, 1-Orange and 1-Red LED displays the momentary voltage situation. You should therefore check the battery packs before each flight.
In fact we suggest that you move the Transmitter control stick in order to make the servos move briefly. By this method you will of course put a slight stress the battery-pack. But as long as the battery display shows the green LEDs lit up then the capacity of the battery- pack is high enough for further use. However, if the Orange LED lights, then you must recharge your battery-packs and you should not start for reasons of safety.
Should the Red LED light up then stop flying immediately! This indicates that both battery packs must be recharged fully, the Red LED display means that they have been discharged to the there lower limit of capacity.

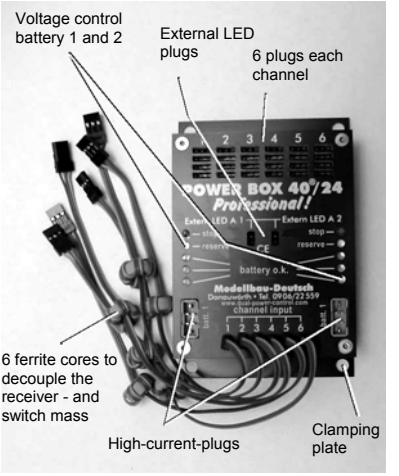
The LED display is non-linear; it is adjusted to the performance of today's NiCd – and NiMH – batteries. Therefore you can control your battery-packs safely and more precisely. We recommend that you let us check the optimal adjustments of the on board Voltage-Controller every two years. We cannot of course give you any information on how long your battery-pack will last because this depends on the capacity of the battery-pack used as well as the total number of servos installed in your model and the number of command signals given.

You can also use the voltage control of our **POWER BOX 40/24** in order to check for any defect cables, plugs and switches etc. If one of these components is damaged, a higher voltage drop is displayed by the LEDs. It is important that you repair the damage indicated before getting your model airplane airborne again.

2. Specifications

Working voltage:	4 V to 8 V
Power supply:	2 NiCd respectively NiMH battery packs with 4 or 5 cells
Power input:	approx. 230 mA
Voltage loss:	approx. 0.25 V
Servo-connections:	16 slots with up to 2 servos each
Max constant current:	2 x 20 A
Temperature range:	-10° C to +55° C
Size:	115 x 75 x 19 mm (without base plate)
Weight:	125:grams.

3. Connections and operation controls



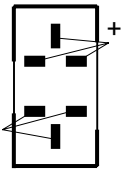
The power supply of the receiver is provided by six servo-cables. Please connect the servos to the channels of your receiver to which the servo-pulses should be amplified due to extra number of servos connected to the **POWER BOX 40/24** line-out.

In order to supply the receiver with the optimum voltage, please make sure you connect all connecting cables to the receiver. Even if you are not using all of the six control-channels, the connecting cables supply the receiver with the necessary power.

Do not connect the **Dual-Power-Control** box with the receiver via two servo-plugs only when two channels are dispersed. Please take

channels, which are not in use, or use V-cables in order to provide a low resistance-connection of the receiver(s) and the battery-packs via the **POWER BOX 40/24** Professional.

The Channel number at the servo line-in of the **POWER BOX 40/24** is identical to the number of the Rx output block. Therefore if you connect connection No: 1 with line-out No: 2 of say a Graupner/JR receiver for example (aileron), then you can connect up to six aileron-servos directly. Or in the case of an extra large model-aircraft up to eight servos using a special V-servo cable, sometimes also called a Y-Lead.



Connecting diagram – High Current Plug (top view)

Due to our special circuitry you will not have any problems with any attenuations, distortions or interference of the servo-pulses should you wish to use cables of up to two meters in length this is due to our use of high quality integrated amplifiers.

The two battery-packs are connected via two “high-current” plugs. The **POWER BOX 40/24** would of course work with one battery. But you would not have the extra security of using a double power supply. We are able to deliver matching battery-packs with the correct high current plugs already fitted. However, if you want to make the power supply cable yourself, then you must use two pole-proof high current plugs for the connection to the battery-pack. The plugs must not be connected to the wrong pole! Also please ensure that the cables are soldered correctly. Make sure that you take notice of the caption on the plug and also of this sketch in order to avoid any wrong connections. This would of course destroy your **Dual-Power-Control**. Ensure that you have a good joint and insulate the (Plus) + and (Minus) - connections against each other as well as against their surrounding area and make sure that no short circuit can happen at any time.

4. Information on usage and security

Please use only low internal resistance battery-packs of the best quality as a supply for your flight set. Use battery-packs of a higher capacity for your receiver. If one battery happens to fail during flight, then the other one will provide enough energy for the receiver. Use only battery-packs of the same type. It’s the only way for the safe use of your model aeroplane. You may use high-quality battery-packs from our stock. We stock battery-packs covering a wide range of possible uses for models of all types. You can therefore take full advantage of our many years of experience thus ensuring the total safety of your model aeroplane.

Of course there will be no problem should you wish to connect two independent receivers to our **Dual-Power-Control** unit. But you must read the manual that comes with these receivers concerning the use of the two receivers in order to

avoid any possible interference. The power supply for the receiver is provided by the six servo-connection-cables of the **POWER BOX 40/24** to the two-servo line-ins for each receiver. Please choose the channels for each of the receivers, for which the impulses are to be amplified.

Place the **Dual-Power-Control** unit, just like any other part of your on board aeroplanes flight set, in such a position in your model where it will be safe from any vibrations. The unit's electronic LED display may be damaged if the vibrations are too severe. But it is impossible that the **Dual-Power-Control** will ever break down due to these vibrations. So the power supply necessary to your receiver is fully guaranteed at all times.

The **POWER BOX 40/24** Professional has two pole proof plug sockets on its upper side. If you use an extension flex, you can plug in an extra bright red LED with your **Dual-Power-Control** for each battery-pack. You may increase the length of the cables, but please make sure that you connect it correctly!

These ultra bright LEDs can be installed on the side of the fuselage of your model-aeroplane. You will then get an optical warning-sign as soon as one or both battery-packs start to diminish or should another defect in the energy-supply occur. If this happens you must land your airplane immediately. We would suggest that you install both LED's quite close to each other. The warning signs will be easier to recognize due to the much brighter light of the two LED's being close together.

The ferrite core in the cables connected to the **Dual-Power-Control** doesn't suppress interferences of the impulse-signal because of very long servo-cables. This task is actually achieved by the efficiency of the integrated servo-pulse-amplifiers. The ferrite cores decouple the GND of your receivers and also the GND of the **Dual-Power-Control**. This makes sure your receiver(s) work(s) in the parameters set by the manufacturer. The GND of your receiver is the counterweight to your antenna. This GND ratio shouldn't be changed to a great extent in order to keep the correct adjustment. Therefore we used a ferrite core to decouple each of the servo-cables.

The adjustment of a receiver by your manufacturer is usually done with at least one servo connected in the same way as it is to be used during a flight in a model-aeroplane. That's the reason why you should always connect a servo with a special task or thrust directly to your receiver. This then ensures that your receiver works under similar GND-circumstances as it did during the factory set-up adjustments. That's the reason why we won't construct a **Dual-Power-Control** where all receiver-channels can get dispersed. The model-aeroplanes that the **POWER BOX 40/24** Professional was constructed for probably have receivers with far more than six channels. So the Servos can always be directly connected to the receiver.

The clamping-plate has four holes, which will help you when installing the **Dual-Power-Control**. Install the **POWER BOX 40/24** in a good position, which will allow you to see and check the **Dual-Power-Control** from outside of the plane.
Then connect the two battery-packs to the **Dual-Power-Control** with a separate switch for each. We would also recommend that you use our special high-current switches for easy use.
If you operate first one and then the second switch, you can check the **Dual-Power-Control**. The LED's must display the momentary voltage of the battery-pack. Then you connect – while you have interrupted the power supply – to the receiver. The receiver set must work even if only one battery is being activated. You can check this fact by switching on the transmitter and moving the rudder.

The **POWER BOX 40/24** fully meets the EMV-Requirements. Therefore it has the CE-badge. The **Dual-Power-Control** is built for use only in models and must be used only in remote-controlled models. You should use it only with D.C., which is provided by a NiCd-or-NiMH battery with a maximum of 5 cells. Don't consider using it with your home power supply.

5. Warranty information

Each **POWER BOX 40/24** has had to pass through several tests during its production phase. We put special emphasis on producing a very high quality-product. This fact enables us to give you a guarantee on our **Dual-Power-Control** of 24 months from the day of your purchase. This means that we will repair proven any faults in the product during this period. We may decide to exchange the **Dual-Power-Control** if a repair is not possible.

The dated receipt you receive when buying the unit is the proof for the duration of the warranty. A repair will not increase the life of the warranty.

Should you damage the **POWER BOX 40/24** e.g. by connecting it to the wrong poles, by exceeding the voltage limit, which is described in the specifications, you will forfeit your warranty. This also applies should the unit experience any damage due to heavy wear or excessive vibrations. Further demands on damages caused by the **Dual-Power-Control** are also excluded. Any demands for damages caused by the **POWER BOX 40/24** whilst using it are also excluded.

If you have to return your **Dual-Power-Control** for any reason, please ensure that you pay all the necessary forwarding expenses. We cannot accept any non-prepaid packages. We do not accept any liability for damages due to transport damage or any loss of your package. In case of a warranty claim please send the **POWER BOX 40/24** together with your voucher to the address shown on the last page. Please also try and give us a brief description of the malfunction noted.

Exclusion of warranty

We cannot control whether you install your **Dual-Power-Control** as described or the circumstances of its usage nor the attendance of the whole remote control system.

Further we do not accept liability for losses, damages or any other costs resulting in the use or operation of the **Dual-Power-Control**, which maybe connected with it in anyway or under any circumstances.

As far as it is lawful, the duty of indemnification, no matter for what reason, will be restricted to the sum of your voucher of products from our company.

6. Additional equipment

As a connection from battery to the **Dual-Power-Control** we recommend that you use our special **High-Current-switches** at all times. These specially produced switches are adjusted to suit our **POWER BOX 40/24**. They can manage the higher current required far better than any other switch now being used for flight sets in modelling.

Our **High-Current-switches** offer real security. This will provide a safe connection by using 8 independent contacts for switching the + & - pole. A green LED is integrated into each **High-Current-switch**. This bright green LED shows you the momentary situation of the switch.

Furthermore an extra feature is a plug-in socket for recharging built into the switch housing which can handle a recharging voltage of up to 2 A. However we wish to point out that fast charging via this plug-in isn't possible with some battery chargers. In this case we recommend that you rapid charge directly via an accumulator-plug. By using our special **High-Current-switches** you will of course increase the safety factor when flying your model aeroplane.

Please Note

If it is not possible to install your **POWER BOX 40/24** in a prominent position where you can see the LED's easily. Then we are able to offer you the further possibility of connecting two extra bright LED's for each of the battery packs. You can install these ultra bright LEDs in a prominent position in your model then you will have an early warning of any voltage-drop when you see the bright LED's shining.

We trust that you will enjoy modelling using your new **Dual-Power-Control** system.

Donauwoerth, Oct. 2001

Modellbau-Deutsch
Hindenburgstraße 33
86609 Donauwoerth
Germany
Phone +49 906 22559
Fax +49 906 22459
E-mail info@dual-power-control.com
Internet www.dual-power-control.com