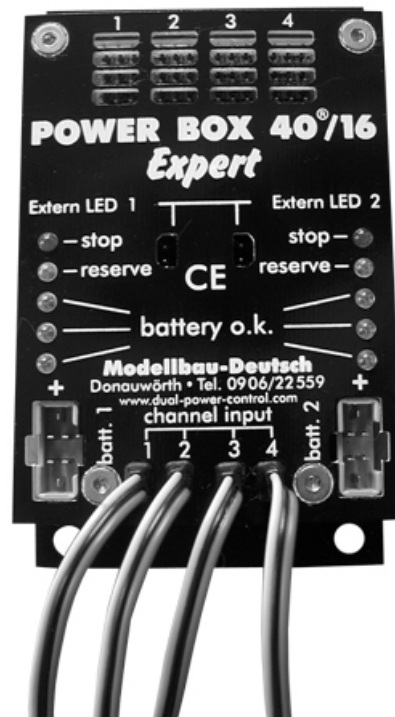


# *The Modelling Expert*

Operating Instructions

## **POWER BOX 40/16**

**The Dual-Power-Control System**



Featuring four servo-pulse amplifiers plus two independent voltage-controllers.

Dear Customer,

We are very pleased that you have decided to purchase our **POWER BOX 40/16**. 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 four 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 40/16**.

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**1. Function of the Dual-Power control**

The **POWER BOX 40/16** 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.

In addition you can also connect up to four servos covering the four 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 four 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.

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 40/16** 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 two special heavy-duty switches along with our double cable circuitry we provide you maximum flight security.

The **POWER BOX 40/16** 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 accu-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 40/16** 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.

Our **Dual-Power-Control** system provides each of the four receiver line-outs with a powerful precise servo-pulse-amplifier. On the one hand you are able to connect up to eight servos on just one channel. Long cables runs used for servos in the wings of large models will not cause you any problems when used with the Power-Box 40/16. This is because all of the servos connected to your Power Box will receive an exact impulse with complete amplitude due to the precision of the amplifiers used.

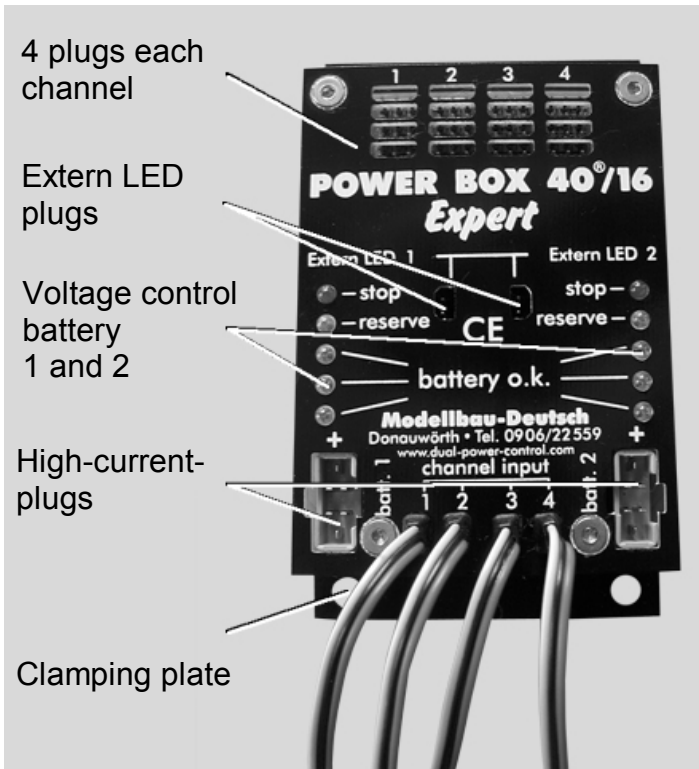
The servo-pulse-amplifier also protects the receiver from interference pulses, which are produced when using such long servo-cables. This feature also provides an even higher level of flight security.

## 2. Specifications

Working voltage:	4 V to 8 V
Power supply:	2 NiCd respectively NiMH accu 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:	91 x 65 x 18 mm (without base plate)
Weight:	77:grams.

### 3. Connections and operation controls

The power supply of the receiver is provided by four 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 line-out.

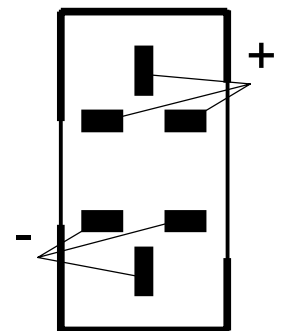


The Channel number at the servo line-in of the **POWER BOX 40/16** is identical to the number of the Rx output block. Therefore if you connect connection No:1 with line-out No:2 of say a Graupner/JR receiver for example (aileron), then you can connect up to four aileron-servos directly. Or up to eight servos via special servo V-cables in the case of an extra large model-aircraft!

Due to our special circuitry you will not be troubled by any attenuations, distortions or interferences 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 40/16** 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 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 space and insulate the "+" and "-" connections against each other as well as against their surrounding area and make sure that no short circuit can happen at any time.



Connection diagram

Top view

#### 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 power-control unit. But you must read of 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 four servo-connection-cables of the **POWER BOX 40/16** 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 electronic LED display part of the unit 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 clamping-plate has four holes which will help you when installing the switch. Install the **POWER BOX 40/16** in a position which will allow you to see and check the switch from outside of the plane.

Then connect the two battery-packs to the dual-power-control with a separate battery 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 storage battery is being activated. You can check this fact by switching on the transmitter and moving the rudder.

The **Power Box 40/16** fully meets the EMV-Requirements. Therefore it has the CE-badge. The switch is built for use only in models and must be used only in remote-controlled models. You may use it only with D.C., which is provided by a NiCd- or NiMH-storage battery with a maximum of 5 cells. Don't use it with power supply.

## 5. Warranty information

Each **Power Box 40/16** 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 switch 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 switch 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** whilst using it are also excluded.

If you return your **Dual-Power-Control**, please ensure that you pay all the necessary forwarding expenses. We cannot accept any non-prepaid packages. We do not take on any liability for damages due to transport damage or any loss of your package. In case of a warranty claim please send the switch together with your voucher to following address. Please also give us a brief description of the malfunction noted.

## 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 40/16**. 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 our each high-current switch. This bright 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. But we want 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 for your model aeroplane.

If it is not possible to install your **POWER BOX 40/16** in a prominent position where you can see the LED's easily. Then we are able to offer you the possibility to connect 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. You will then be warned of any voltage-drop when you see the bright LED shining.

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

Donauwoerth, Oct. 2001



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