

Shanghai Dualsky Models co.,Ltd.
Rm.1016,No.201,Xin Jin Qiao Rd.,Shanghai,China.
Tel: +86 21 50322162 Fax: +86 21 50322163

VR Pro Duo

High-End Linear Regulated Power Supply Module
双路高端线性稳压电源模块

DUALSKY®
ADVANCED POWER SYSTEMS

Instructions Manual 使用说明书 No.46746



Design features

- Miniaturization design, input & output port using horizontal row;
- Dual battery input design, automatic switching and balancing between batteries;
- 4 current outputs, support 4 channel servos direct connection;
- Plug and play. No need to weld the connectors;
- Internal dual input voltage monitor for low voltage with memory function;
- Support HV servos (7.4V), output voltage is switchable;
- Includes FSS-3, the failure safety switch with status indicator (#46813), VR Pro Duo also supports FSS-4 lightweight switch(#46814);
- Equipped with heat sink and external cooling fan (#46816);
- Support up to 10pcs of 30kg digital servo;
- Can be used on the largest 13KG model aircraft, eg.120CC Gasoline Powered Aircraft.

Electrical Features

- Linear regulator, no interference, low ripple;
- The input power uses simulated diode dual redundancy power supply;
- Double MosFET output, independent linear control IC, high output current capability;
- Low dropout design makes fully use of the cell's capacity, especially on HV mode;
- Large heat sink, good heat dissipation and high overload capacity;
- Built-in MCU precisely controls FSS-3 and internal voltage;
- Fail safe design, ensuring Non-stop work;
- SMT process, ensuring the quality;
- Input & output port all use high quality tantalum capacitors;
- Dualsky Shanghai factory assembled, fully tested before dispatch.

Specification

Input voltage:	DC5.3V -8.4V, MAX10V (2S LiPo)
Output voltage:	5V, 6V, 7.4V (Switchable, Tolerance + 3%)
Output current:	DC 0 -15A (Vin-Vout =1V)
Minimum differential voltage:	< 0.3V
Power effect:	%0.3
Voltage effect:	%0.3
Output ripple:	< 2mV
Size:	63mmX32mmX18mm
Weight:	62g (including duo input wires)

How to use

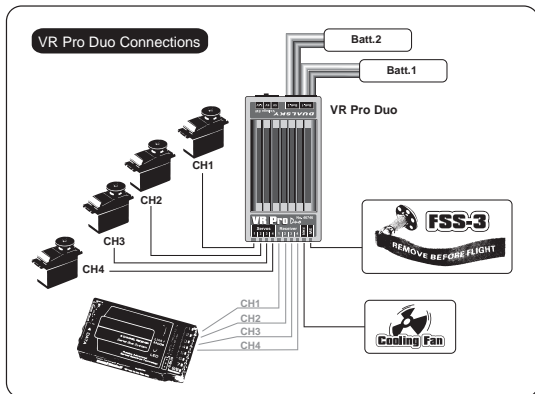
VR Pro adopts a horizontal row as input and output,(see the right picture).

According to the label instructions, the four sockets on the left are for servos.

The four sockets on the middle are connect to the receiver with the output wire (#46815). The four sockets on the left correspond one to one to the four sockets on the middle. This design has the advantage of plugging the largest power consumption servos in VR Pro Duo to reduce the receiver burden. Also solve the 4 output wires taking too many receiver channels problem. Two sockets on the right side are respectively for fan and control switch.

VR Pro Duo has two battery input wires on the opposite side. It can be connected with two batteries for power supply. VR Pro Duo can also connect 1 piece of battery for work.(We suggest to use Dualsky 20C series 2S li-po battery for VR Pro Duo) When these wires are connected correctly, please remove the FSS-3 plug pin to work.





During working, the built-in two monitors display the two batteries voltage respectively. the built in tri-color monitors display battery voltage: over 7.4V with green light, 7.4V to 7V with yellow light, lower than 7V with the red light. When the red light on, the user should stop using as soon as possible. The red light warning has memory function, it indicates that the battery has fault (low voltage, poor contact or system overload). Close the switch and re-open it can reset the memory. When one battery fails, the system will switch to another battery to work automatically. This enhances the safety of power supply greatly.

In normal operation, FSS-3 power indicator always lights, if any power failure (low battery, overload or bad connection), it will enter the alarm mode, the lights will flicker, this mode also has memory function. Power off and eliminate the malfunction. Power on again to restore the normal status.

FSS-3 power switch, FSS-4 power switch (optional), the voltage display circuit and output voltage select switch are all using the "fail safe" design. Any fault will not take the initiative to turnout VR Pro Duo power output. When the voltage select switch fails, the output voltage will be set to 5V.

Safety attentions

(Failure to follow these instructions can be damage your product, and cause serious bodily injury or death.)

- Not suitable for children under 14 years old without adult guidance;
- Do not use it in the high temperature or humid environment;
- When using this product in strong vibration environment, vibration mitigation measures should be used;
- Please remove the packing material before use VR Pro Duo;
- Since the output current is large, please use 4 output wires to connect the receiver;
- This product supports switching voltage. Please select the voltage according to the supply voltage of your receiver, servo or other equipments!;
- Do not change the output voltage while VR Pro is working;
- Output port short circuit will damage VR Pro;
- In order to ensure the VR Pro Duo working properly, please obey the following formula to limit the thermal power in a safe range:
 - (1) $(\text{input voltage} - \text{output voltage}) \times \text{output current} \leq 15\text{W}$;
 - (2) Please pay special attention to that, if the VR Pro current is over 15W for a long time, the temperature will rise quickly, it will damage the regulator;
 - (3) When the cooling fan is mounted (#46816, optional), the thermal power can be increased to 20W;
 - (4) VR Pro will not stop working when the input current is too large. But the internal limit working temperature is 120 degrees. When the temperature is more than this limit, it will damage the control IC.
- The two input batteries should be in the same specification and same charge cycle;
- The voltage indication and alarm is preset according to the lithium polymer battery;
- Notes: If you don't use the regulator in 24 hours, you'd better disconnect it from the battery because it remains a 3mA quiescent current.

VR Pro Duo

双路高端线性稳压电源模块

使用说明书

No.46746



VR Pro Duo

产品特点

- 小型化设计，接口采用水平排针，应用方便；
- 双电池冗余输入设计，电池间自动切换、均衡；
- 4路电流输出，支持4通道舵机直连；
- 即插即用，无需焊接插头；
- 内置双路输入电压监视器，对低电压有记忆功能；
- 支持HV伺服系统（7.4V），可开关切换
- 标配带状态指示的FSS-3（#46813）失效安全开关，支持FSS-4（#46814）轻量开关
- 大尺寸散热器，并可外接散热风扇（#46816）；
- 支持10颗30kg级别数码舵机同时工作；
- 可在最大13Kg模型飞机使用，例如：120CC汽油动力飞机。

电气特点

- 线性稳压，低纹波，无干扰；
- 输入电源采用模拟二极管双路冗余方式供电；
- 采用双MOSFET输出，独立线性控制IC，大电流输出能力强；
- 输入输出均采用低压差设计，充分利用电池容量，HV模式下效果明显；
- 大面积散热器，具有良好的散热、抗过载能力；
- 内置MCU，精确控制FSS-3和内置电压监视器工作；
- 整个系统采用Fail safe设计，确保不间断工作(Non-stop)；
- 主板采用SMT贴片工艺生产，保证质量；
- 输入，输出端均采用高品质钽电容；
- 双天上海工厂组装，全检出厂。

主要技术参数

输入电压：DC 5.3V - 8.4V, MAX 10V(2S LiPo)

输出电压：5V、6V、7.4V (Switchable, Tolerance $\pm 3\%$)

输出电流：DC 0 - 15A ($V_{in}-V_{out} \leq 1V$)

最小压差：0.3V

电源效应： $\% 0.3$

电压效应： $\% 0.3$

输出纹波： $\leq 2mV$

外形尺寸：63mmX32mmX18mm

主机重量：62g (含双路输入线)

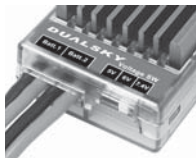
使用说明：

VR Pro Duo 采用水平排针作为输出，如右图。按稳压器标签指示，左边四个插口 (Servos) 连接4个通道舵机，中间4个插口 (Receiver) 通过输出线 (#46815) 与接收机相连。舵机插口号与输出插口号对应，舵机对应通道就是对应输出线插在接收机上的通道。此设计的优点在于可以将耗电量最大的几个舵机连接在VR Pro Duo上，降低接收机工作负担。同时解决了4路输出线占据过多接收机通道的问题。右边分别为风扇和控制开关插口，只要对应连接即可。连接时注意插头凸起对应插口槽。

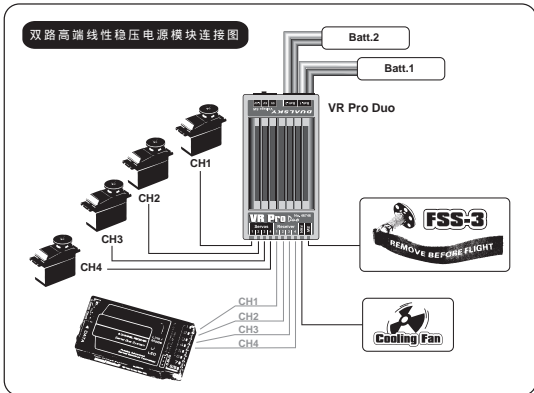


注意事项：

- 本品不是玩具，14岁以下儿童使用需要有成人监护；
- 请勿在高温、潮湿的环境下使用；
- 在强烈振动环境使用本产品时，应做好缓振措施；
- 请勿将VR Pro Duo整个包裹后使用；
- 由于输出电流较大，请采用4根输出线连接至接收机；
- 本产品支持电压切换，使用此电压时，请确认你的接收机、舵机或其他设备支持该电压；
- 不要在稳压器工作时切换输出电压；
- 输出端绝不可以短路；
- 为确保VR Pro Duo正常工作，请遵守下面的公式，将发热功率限制在安全范围内：
 - (1) (输入电压 - 输出电压) x 输出电流 <= 15W；
 - (2) 如果长时间大于15W，温度会快速上升，可能会损坏稳压器，请特别注意；
 - (3) 安装冷却风扇（#46816，选配件），热功率可以提升20W；
 - (4) VR Pro Duo不会因为输入电流过大而停止工作，但内部极限工作温度为120度，超过控制IC将损坏。
- 两路冗余输入应采用相同规格和使用循环次数的电池；
- VR Pro Duo电压指示和报警按照锂聚合物电池预设；
- 如果你长时间（24小时内）不使用VR Pro Duo，请断开和电池的连接，因为待机状态下也会有3mA耗电。



VR Pro Duo另一侧有两路输入电池连接线，可以接两颗电池冗余供电。VR Pro Duo也可以只接一块电池工作。建议采用2组双天20C系列2S锂聚合物电池为VR Pro Duo供电。旁边的3档开关可以选择输出电压，档位分别是5V/6V/7.4V。上述连接确认无误后，将FSS-3上的插销移除即可工作。



工作中，内置双路监视器分别显示两路电池电压；7.4V以上，绿灯亮，7.4V-7V，黄灯亮，如果电压低于7V，红灯亮，此时应尽快停止使用。红灯警告有记忆功能，表示该路电池曾经故障（电量低、过载或接触不良），关闭电源消除故障后，重新方可恢复。一路电池故障，系统会切换另一路电池维持正常供电，大大提升供电安全。

正常工作时，FSS-3电源指示常亮，一旦任何一路电源故障（电量低、过载或接触不良），则会进入报警模式，指示灯开始闪烁，此模式同样有记忆功能，关闭电源消除故障后，重新方可恢复。

FSS-3电源开关、FSS-4（选配）、电压显示电路和输出电压选择开关均采用Fail safe“失效安全”设计。任何故障不会主动关闭VR Pro Duo的电力输出。当电压选择开关失效后，输出电压被设定在5V。