

## Extreme-Heli (GVR-7020) Dual Linear Voltage Regulator

Gryphon Extreme-Heli regulator is dual linear regulator consisting of hybrid components with the power supply scheme by reboost power bus, which is high-end grade regulator to satisfy both utmost Extreme 3D flying and F3C to pursue perfect stability for high-class users.

This regulator, is actively applied with rapidly changing RC environment such as popularizing trend of Extreme 3D flying, becoming bigger of the body and high performance of the servo from the product design stage, has been developed to focus on the quality and stability of power and the improvement of transient response of entire power system instead of traditional method which uses simple current capacity as a measure for designing a regulator. In addition, the safety as well as user's convenience are secured to add the alarm function for low voltage of the receiver battery.

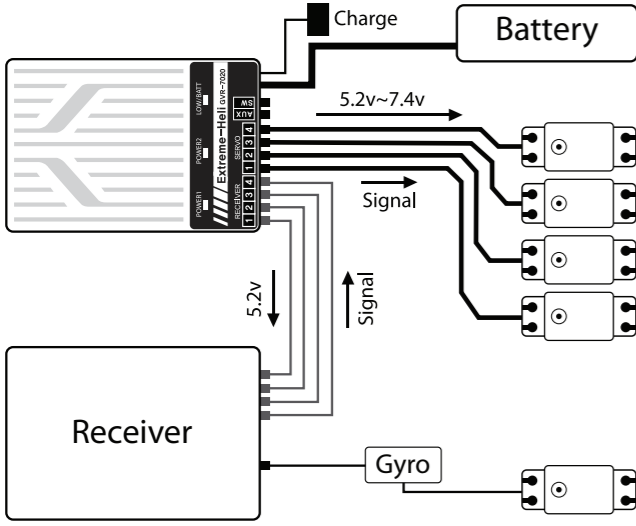
Power supply scheme by the reboost power bus uniformly distributes power required for CCPM servo channel to guarantee stable property of the body, and can perform faithful Gyro function with excellent blocking effect against external noise such as reverse electromotive force of CCPM servo due to direct connection between the gyro system and RX.

It has passed various electronics countermeasure test and long-term field test, and optimized to tune with extreme operating environment as the project product even through the test for extremely hot weather in a desert region. Therefore, it should be the masterpiece of regulator to find differentiated performance other than any products experienced before.

**※ What is the Reboost Power Bus?**

**It is state-of-the-art power supply system trying to obtain operating stability for a servo and maximization of performance to rapidly supply the voltage and current required for a servo of each channel by the shortest path, maximum capacity using a regulator as a hub of power system instead of traditional scheme supplying power for a servo via a receiver.**

- ※ Specifications**
- Input voltage : 6 to 10 Volts (5 to 8 cell NiCd/MH or 2cell LiFe/Po)
  - Output voltage : Servo channel 5.2V, 6.0V, 6.8V, 7.4V, 8.4V(Bypass)  
RX channel 5.2V(Fixed)
  - Output current : Servo channel 10A(MAX15A @6.0V)  
RX channel 5A(MAX10A)
  - Low voltage alarm setup : LiFe type(6.5V) LiPo type(7.3V) Enable to setup
  - Switch type : Fail safe(Fail-Safe-On) Pin-flag Contactless Type
  - Power connector type : DINS Connector Type
  - Size : 17mm(H) x 40mm(W) x 64mm(L)
  - Weight : 45g (Excluding cables)
  - Components : Main unit 1EA, RX cable 4EA, Switchboard & Cable 1EA, Operating guide



- ※ Features**
- ◆ As the world's famous products have kept just DC-DC voltage regulator of linear type, this product is also dual channel linear regulator that wouldn't fundamentally generate switching noise and ripples contrary to switching-type regulator and has superior voltage stability, current supplying capability, and transient response against radical load variation. Therefore, it is enable to safely apply to PPM, PCM schemes as well as all system including 2.4GHz.

- ◆ Total electric current consumption during extreme 3D, F3C, flight approaches 8A. Thus traditional power supply scheme has limits not to effectively operate servos. To improve it, this product is applied with the reboost power bus scheme based on new concept that a regulator directly supply power to a servo for each channel instead of passing battery power through a receiver.

- ◆ Contrary to existing products that two same regulators are packed in a case, it has manufactured that each electronic device can achieve the best performance with designing hybrid type to use each other output component for CCPM servo's circuits emphasizing the power and responsibility, RX and Gyro's circuits emphasizing the voltage stability and noise-free.

- ◆ Output voltage setup is designed to choose required voltage among five preset voltages of 5.2V, 6.0V, 6.8V, 7.4V, 8.4V(Bypass) by four-stage DIP switch. Therefore, additional device to measure the voltage is not required for voltage setting and everyone can easily and quickly set the voltage.

- ◆ Low voltage alarm circuit is embedded to guarantee user's convenience and safety. According to the type of battery or the preference, alarm voltage can be arbitrarily established(7.3V or 6.5V) and chosen whether or not to use.

- ◆ If the voltage of main battery falls below the voltage established for low voltage alarm, low voltage alarm circuit begin to operate. Both LOW/BATT LED display and buzzer on main unit are simultaneously active, external LED board(GDB-1010 option), mounted on the fuselage, distinguishable even in flight is equipped. Three high-luminance LEDs on external LED board quickly flicker on and off in the case of low voltage so that it is possible to immediately recognize low voltage alarm condition even in day long flight.

- ◆ There are input/output ports for four channels. Three servos for CCPM as well as throttle servo can supply the power optimized to servo specification(4.8V or 6.0V), and the voltage optimized to each servo even for system using 4.8V mixed with 6.0V servo.

- ◆ It is supported to use 7.4V HV servo. If output voltage is setup to 7.4V or 8.4V(Bypass), it is able to achieve more stable power supply and transient response than 7.4V battery direct connecting scheme to perform the buffer regulator function along with capacitor circuit.

- ◆ If the battery voltage is lower than the regulator setup voltage, safety accident from shut-down bypassing the battery voltage to the output voltage can be prevented.

- ◆ Fail-safe-on Pin-flag switch board(GSB-1010P) is basically installed, and slide switch board(GSB-1010S) to consider each user's preference and convenience is provided as additional product. Each switch board is equipped with LED to check regulator's operation.

- ◆ Inconvenience to charge after separating the battery while charging is improved by using charging and voltage checking cable.

- ◆ Dual battery input is supported for special purpose user. If additional battery is connected with charging and voltage checking cable, two battery power can be supplied to the regulator in parallel.

- ◆ Various cables, switches, and LED unit can be arbitrarily removable depending on user's convenience, and they are manufactured as modules to extend or reduce cable's length and to exchange, and can be purchased separately.

**※ How to install and use**

1. Setup output voltage of servo channel  
Establish voltage to output to a servo channel. Output voltage is established by DIP switch on the back of main unit. Left no. 1 to 4 switches are 4.8V, 6.0V, 6.8V, and 7.4V selection switch respectively, and just a switch suitable for corresponding voltage is chosen to turn on. If all switches are turned off, output voltage is 8.4V(Bypass). Initial setup value at the factory is 6.0V

2. Setup low voltage alarm  
Low voltage alarm is battery check function that user can recognize low voltage condition by buzzer and high luminance LED when main battery's voltage directly detected by regulator falls below established voltage. Selectable voltages are 7.3V for LiPo battery and 6.5V for LiFe battery, which can be selected with No.5~6 switches on the back of main unit. **If all switch are turned off, low voltage alarm function is stopped.**

☞ Battery to charge well wouldn't usually drop the voltage down to alarm voltage(7.3V for LiPo) for normal servo load at ambient temperature(20°C). Thus if low voltage alarm is caused by 1~2 times flight after charging, insufficient battery charging, degradation of battery, or wiring condition should be checked. **But in cold winter season, because of the property of LiPo battery the voltage drop becomes larger to be possible to frequently generate low voltage alarm. For such an case, it is recommended to use large capacity battery or high discharge rate battery. In addition, low voltage setup value is recommended 6.5V which is one level lower than 7.3V.**

☞ The standard value of low voltage is 7.20~7.30V for 7.3V setup, 6.40~6.50V for 6.5V setup, which has the range of about 0.1V. The time occurring low voltage alarm is slightly different within the tolerance for each product, but characteristic alarm voltage assigned to certain product must not be changed. Therefore, if the voltage at the time when low voltage alarm occurs is checked for purchased product, correct voltage at the time when low voltage alarm occurs could be known.

☞ If a servo is quickly moved even when power switch is off, low voltage alarm is occurred. It is not a breakdown but a status of reverse electromotive force which the power generated by a servo motor is reversely supplied to a regulator. In addition, **if the transmitter antenna or oscillator is approaching near low voltage alarm circuit, low voltage alarm could be temporarily generated due to the influence of strong electromagnetic wave or electromagnetic field, but it is not a breakdown so that it could be used without anxiety.**

### Gryphon

Model : Extreme-Heli GVR-7020  
Input Voltage : 2Cell 7.4V LiPo /  
6.6VLiFe or 6Cell 7.2V NiCa / NiMH  
Output Voltage1 : 5.2V to 7.4V selectable.  
10A (15A MAX)  
Output Voltage2 : 5.2V steady 5A

Caution  
Insert the connectors fully.  
If a connector works loose due to vibration during flight,  
control may be lost and result in a dangerous situation.  
[www.gryphon.co.kr](http://www.gryphon.co.kr) / MADE IN KOREA

- ON OFF Initial setup value at the factory  
**Output voltage : 6.0V**  
**Alarm voltage : 7.3V**
- ON OFF **Output voltage : 5.2V**  
**Alarm voltage : 7.3V**
- ON OFF **Output voltage : 6.8V**  
**Alarm voltage : 7.3V**
- ON OFF **Output voltage : 7.4V**  
**Alarm voltage : 7.3V**
- ON OFF **Output voltage : 8.4V (BYPASS)**  
**Alarm voltage : 7.3V**
- ON OFF **Output voltage : 6.0V**  
**Alarm voltage : 6.5V**
- ON OFF **Output voltage : 6.0V**  
**Alarm voltage : OFF**

4. Switch connection

Connect Fail-safe-on Pin-flag contactless switch to SW port of main unit. Three models of pin type(GSB-1010P), slide switch type(GSB-1010S), and connector type(GSC-1010) are supported, and user can choose one type depending his/her preference and convenience. Pin typed switch is supported as basic type at the factory. If Pin-flag on the switch board is pulled out, power is turned on.  
☞ Switch board(GSB-1010P) could use double-sided foam tape or cable tie, or has a hole to fix with 3mm bolt in the middle of the switch board. **Fix tightly with it.**

☞ Contactless switch consumes very small current as standby current in off status. Therefore, **a battery must be kept separate from connectors of a regulator for long term storage more than 2 weeks.**

Caution and reference  
5. Battery connection

Power input basically supports DINS connectors. Connect a battery to precisely check +/- polarity of male connector. At this time, if switch is on-state, short sound like "peep"

from buzzer could be listened(same as switch is on). This is the signal that low voltage alarm is normally operating. Female connector is the connector for charging and checking voltage. For dual battery, user would exchange female connector for male connector to connect the battery.

☞ **Must be careful with polarity during exchanging connectors. If +/- polarity of a battery is inversely connected, internal circuit should be destroyed.**

6. Receiver & Servo channel connection

Connect four JR typed female-female extension cable enclosed in the product to the channel of the receiver and the RECEIVER channel of the regulator. The regulator supplies 5.2V of power to the receiver via connected cable, and receives the signal of corresponding channel to bypass to the servo channel of the regulator in return. The servo connects to the servo channels of the regulator corresponding to 1~4 channels. As a result, the connection for the reboost power bus scheme that the servo is supplied the power from the regulator and the signal from the receiver is completed.

☞ The case that the servo specifications are the same : If operating voltage specifications of four channel servos are all the same, all four channels are connected.

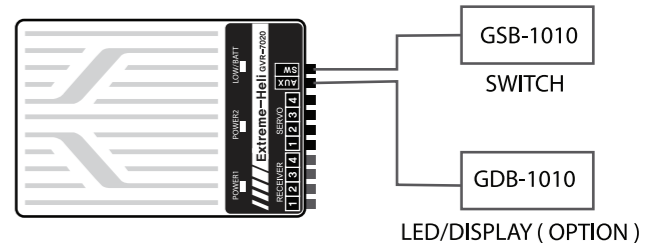
☞ The case that the servo specifications are different : If it is used three CCPM(6.0V) and a throttle servo(4.8V) mixed with devices such as governor, the throttle servo should be used to directly connect with the receiver.

☞ Power(5.2V) to output to the receiver and power(5.2~8.4V) to output to the servo channel are independent circuits to completely separate. Thus, if **the receiver is improperly connected to the servo channel of this product mixed with cables of the gyro or governor, the failure of the devices could be occurred so that it must be careful.**

7. Using AUX channel

Use to connect the LED board(GDB-1010 option spec) for low voltage alarm. In addition, if +/- terminals of AUX terminal is used, the same voltage as the servo channel could be additionally used.

Signal terminal : low voltage alarm output  
+ terminal : the same voltage output as servo channel  
- terminal : common ground



### ⚠ Caution and reference

- ◆ Establish open space to ensure a free flow of air around the heat sink when it is installed on the body, and don't wrap it with fixing sponge and so on.
- ◆ Don't stack up other electronic devices such as receivers or governors on the heat sink.
- ◆ Be careful that connectors wouldn't be pulled out due to vibrations in flight to tightly fix servos and extension cables with main unit of a regulator.
- ◆ Don't disassemble arbitrarily. The product that hologram label is damaged or removed couldn't be received free repair service.
- ◆ Contactless switch consumes very small current as standby current in off status. Therefore, a battery must be kept separate from connectors of a regulator for long term storage more than 2 weeks.

**※ Technical support & Customer Service**

Contact your dealer or e-mail us at address below for questions about our products or Customer Service.

E-mail : [master@gryphon.co.kr](mailto:master@gryphon.co.kr)

GRYPHON  
673-39 Manchon1 Suseng-gu  
Daegu, Korea  
TEL +82 53 783 1796  
FAX +82 53 289 0724  
ULR : <http://www.gryphon.co.kr>  
<http://www.gryphon-mall.com>