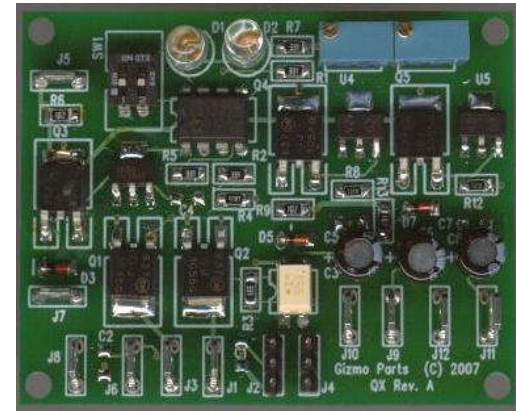


RSGQX



**Battery Eliminator/Dual Switch
Controller/ Dual Power Supply**

V1.0

ROBOTIC SPORTING GOODS

Table of Contents

Introduction	1
Theory of Operation	1
Operation	3
Testing	5

Table of Figures

Figure 1 RSGQX Block Diagram	2
Figure 2 Input/Output Response Plot	2
Figure 3 RSGQX Connector Layout	4
Figure 4 R/C Power & Signal Pin-Outs	7
Figure 5 Example Wiring Diagram	7

If for some reason, the controller stops functioning, simply contact RSG for a repair estimate and return authorization.

LIMITED WARRANTY

THIS CONTROLLER, MANUAL AND REFERENCE MATERIALS ARE SOLD "AS IS," WITHOUT WARRANTY AS TO THEIR PERFORMANCE, MERCHANTABILITY, OR FITNESS FOR ANY PARTICULAR PURPOSE. YOU ASSUME THE ENTIRE RISK AS TO THE RESULT AND PERFORMANCE OF THE CONTROLLER.

HOWEVER, TO THE ORIGINAL PURCHASER ONLY, THE MANUFACTURER WARRANTS THE CONTROLLER TO BE FREE FROM MANUFACTURING DEFECTS AND FAULTY WORKMANSHIP UNDER NORMAL USE FOR A PERIOD THIRTY DAYS FROM THE DATE OF PURCHASE. IF FAILURE OF THE CONTROLLER HAS RESULTED FROM ACCIDENT OR ABUSE THE MANUFACTURER SHALL HAVE NO RESPONSIBILITY TO REPLACE THE CONTROLLER UNDER THE TERMS OF THIS LIMITED WARRANTY.

CONSTRUCTING FIGHTING ROBOTS IS HAZARDOUS AND ROBOTIC SPORTING GOODS OR ITS OWNERS SHALL NOT BE LIABLE FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT. CONSTRUCTING FIGHTING ROBOTS IS HAZARDOUS WORK AND SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONS.

NOTES:

Introduction

The RSGQX is a high current switch controller, receiver (RX) battery eliminator compatible with most R/C receivers, and a dual variable voltage power supply. This manual provides operation and troubleshooting information.

RSGQX Specifications

- Opto-isolated R/C Channel Input
- Built-in hysteresis measurement insures no false triggers
- Automatic Detection of R/C Signal Loss
- Dual Independently controlled outputs (either normally opened or closed)
- Each output is rated to 60V, 3A
- 5V , 800 mA Output for accessories
- Battery Supply 8 – 36V
- Dual Adjustable Supplies from 1.5V – 14V up to 800mA

Theory of Operation

Figure 1 is a block diagram of the RSGQX's switch controller. The controller measures the R/C signal from the receiver. The input is opto-isolated to prevent electrical noise from motors and other high current components from interfering with the receiver.

The signal generated by the receiver is a pulse; 1-2mSec in length repeated every 20mSec. Based on the length of the pulse, the control logic will open or close the open-collector outputs. The outputs must be connected in a way to complete the path to ground, NOT from VCC. This type of output enables you to control a wide variety of relays, motors, and solenoids.

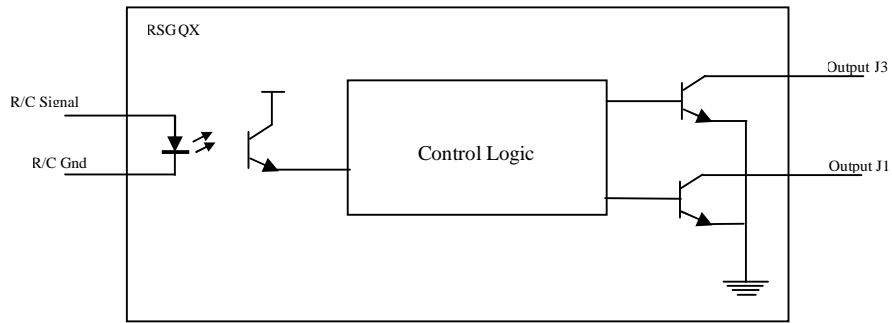


Figure 1 RSGQX Block Diagram

Hysteresis is used to prevent unintentional intermittent switching of the outputs (Figure 2). Table 2 shows the trigger settings for the two outputs. The two switches are used to set the normal position of the outputs. When the receiver is off or the signal is in its neutral position (1.5mSec), the outputs will correspond to the normal settings on the switch. Refer to Table 2 for your application.

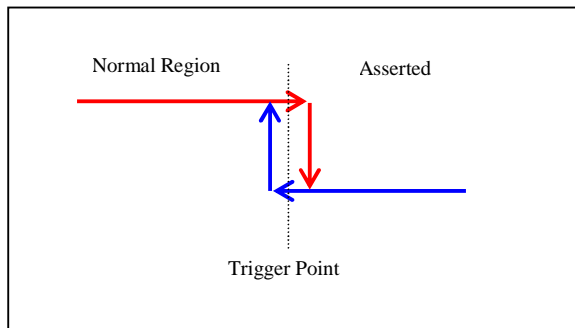


Figure 2 Input/Output Response Plot

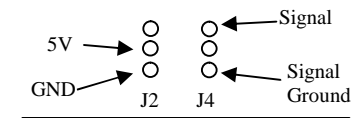


Figure 4 R/C Power & Signal Pin-Outs

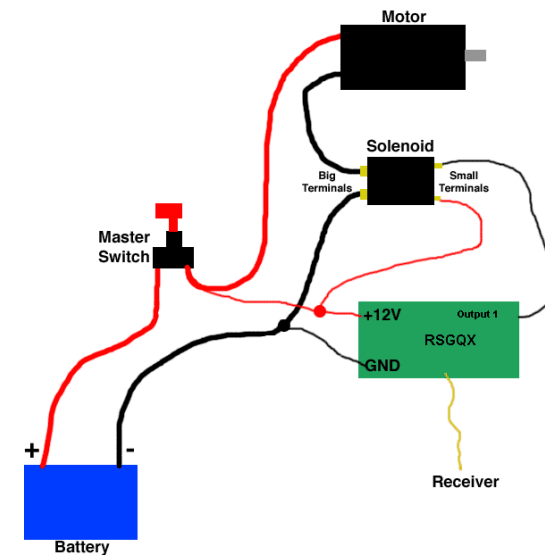


Figure 5 Example Wiring Diagram

Table 4 R/C Receiver Power and Channel

Connector	Description								
J2	R/C Receiver Power This connector supplies power to the receiver.								
<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Ground</td> </tr> <tr> <td>2</td> <td>5V</td> </tr> <tr> <td>3</td> <td>No Connection</td> </tr> </tbody> </table>		Pin	Description	1	Ground	2	5V	3	No Connection
Pin	Description								
1	Ground								
2	5V								
3	No Connection								
J4	Dual Switch Controller Channel This connector is the input to the dual switch controller and is independent of J1.								
<table border="1"> <thead> <tr> <th>Pin</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Ground</td> </tr> <tr> <td>2</td> <td>No Connection</td> </tr> <tr> <td>3</td> <td>Signal</td> </tr> </tbody> </table>		Pin	Description	1	Ground	2	No Connection	3	Signal
Pin	Description								
1	Ground								
2	No Connection								
3	Signal								

Table 1. Output Response Settings

Output	Trigger
J3	~1.25mSec
J1	~1.75mSec

Table 2. Normal Switch Settings

Switch	Position	Output
1	ON	J1 – Normally On, Closed
1	OFF	J1 – Normally Off, Opened
2	ON	J3 – Normally On, Closed
2	OFF	J3 – Normally Off, Opened

Operation

If you are an experienced electronics kit builder, testing the RSGQX will take approximately 30 minutes. If you have never constructed a kit or soldered electronics components, Robotic Sporting Goods strongly suggests getting assistance from someone who has experience with electronic components and their assembly. Proper wiring is essential to insuring safe operation of the RSGQX. Below is a list of recommended tools and materials:

- One battery or power supply
- Multimeter (optional, but strongly recommended)
- R/C receiver
- R/C transmitter

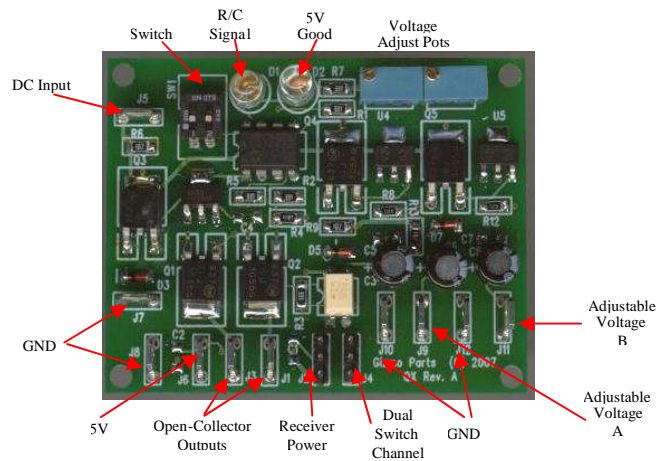


Figure 3 RSGQX Connector Layout

Table 3 Connector Descriptions

Connector	Description
J1	Open-Collector Output 1
J2	5V R/C Receiver Supply
J3	Open-Collector Output 2
J4	Dual Switch Channel Input
J5	DC Input Supply
J6	Auxiliary 5V Output
J7	DC Input Ground
J8	Auxiliary GND
J9	Adjustable Voltage A
J10	Adjustable Voltage Ground
J11	Adjustable Voltage B
J12	Adjustable Voltage Ground

Testing

Remember: Measure & Check twice – connect once.

1. Read and understand instructions completely before performing any steps.
2. Connect a battery to terminals DC Input and GND of the RSGQX. The 5V Good LED should light.
3. Attach the negative lead of the multimeter to GND.
4. With the positive lead, verify the 5V output of the RSGQX at connector J6 and J8.
5. Disconnect the battery.
6. Connect your R/C receiver. Making sure the signal, power and ground connections are correct for your model receiver. See Table 4 and Figure 4.
7. Reconnect the battery.
8. Turn on your transmitter and observe that the green D1 LED lights. If not, review your connections and make your transmitter batteries are charged.
9. Attach the ground lead of the multimeter to Output 1 or 2 and the positive lead to DC Input.
10. Observe that the multimeter shows VCC when the transmitter joystick is moved.
11. Adjust switches 1 & 2 for your application.
12. Adjust potentiometers A & B for the desired output voltage at J9 and J11.