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# SSR-D75135xx-30V-12C

The SSR-D75135xx-30V-12C is designed for DC load switching (solid state relay) applications for voltages not to exceed 30 Vdc and dual independent control voltage inputs of 12 volts at approximately 10 mA for each side. This unit **does utilize opto-isolation**. This dual output, dual control model can be ordered in a variety of output configurations. The Center "B" terminal may be ordered with Common Cathode diodes (**xx** part number term is "**CC**"), Common Anode diodes (**xx** part number term is "**CA**"), or one cathode & one anode common (**xx** part number term is "**N**"). Many applications will benefit by the reliable, high current, versatile dc switching capability. The SSR-D75135xx-30V-12C unit can switch either the high side or low side and can also be configured for back to back mosfet output (CC and CA models) to block current in both polarities (AC loads), or operated in parallel, with a single jumper wire, for **twice** the current handling capability.

Should you have a specific application or question not covered here, feel free to send an e-mail technical support request. Include as much detail as practical regarding your application. Send to: **sales04@hellroaring.com.** Replace the 04 with the current year digits as we may automatically delete e-mails sent to prior year addresses to minimize Spam. Or, check our web site for the current e-mail address.

Depending on your power source capability and wire size utilized, appropriate circuit protection should be installed. The following table includes recommendations for wire protection values. In all cases, we recommend using circuit protection no greater than 150 amps for parallel operation.

| Wire Size AWG | Circuit protection |
|---|---|
| 4 | 150 A |
| 6 | 100 A |
| 8 | 60 A |
| 10 | 40 A |
| 12 | 25 A |

The circuit protection listed is for continuous current.

## H-Bridge Switching Applications:

**Diode suppression** for inductive loads is recommended for most applications. For the H-bridge configuration using 4 units, additional diode suppression may not be necessary because it is essentially built-in to the configuration, but is recommended anyway for highly inductive loads. For installation, follow these steps:

1) For highly inductive loads, Verify the load has diode suppression installed as illustrated. In addition, a small TVS is recommended across the power and ground input.
2) Connect the power source Positive (+) to terminal "A".
3) Connect the load to terminal B.
4) Apply ground to terminal C.
5) Repeat for a second Dual SSR for the H-Bridge configuration.
6) When using the Hellroaring H-Bridge SSR Control Module, connect it to power and the appropriate SSR control input terminals. See the image and diagrams.

The unit is now ready for switching. Apply 12V power and then apply the appropriate control logic to the control module inputs. **Do not disconnect the load while the SSR is switched ON.**

**Note on Diode Suppression**

The Hellroaring SSR-D75135**xx**-30V-12C series have built-in suppression for slight inductive loads with a dissipation up to 0.5 Joule per half. For higher inductive energy, you will need to use external means to protect the SSR. We recommend a 5KW peak TVS across the power and ground input terminals A and C (N versions), and a larger TVS between across the load (for highly inductive loads).

**Note: The image below illustrates one possible physical connection arrangement for the H-Bridge and control module.**

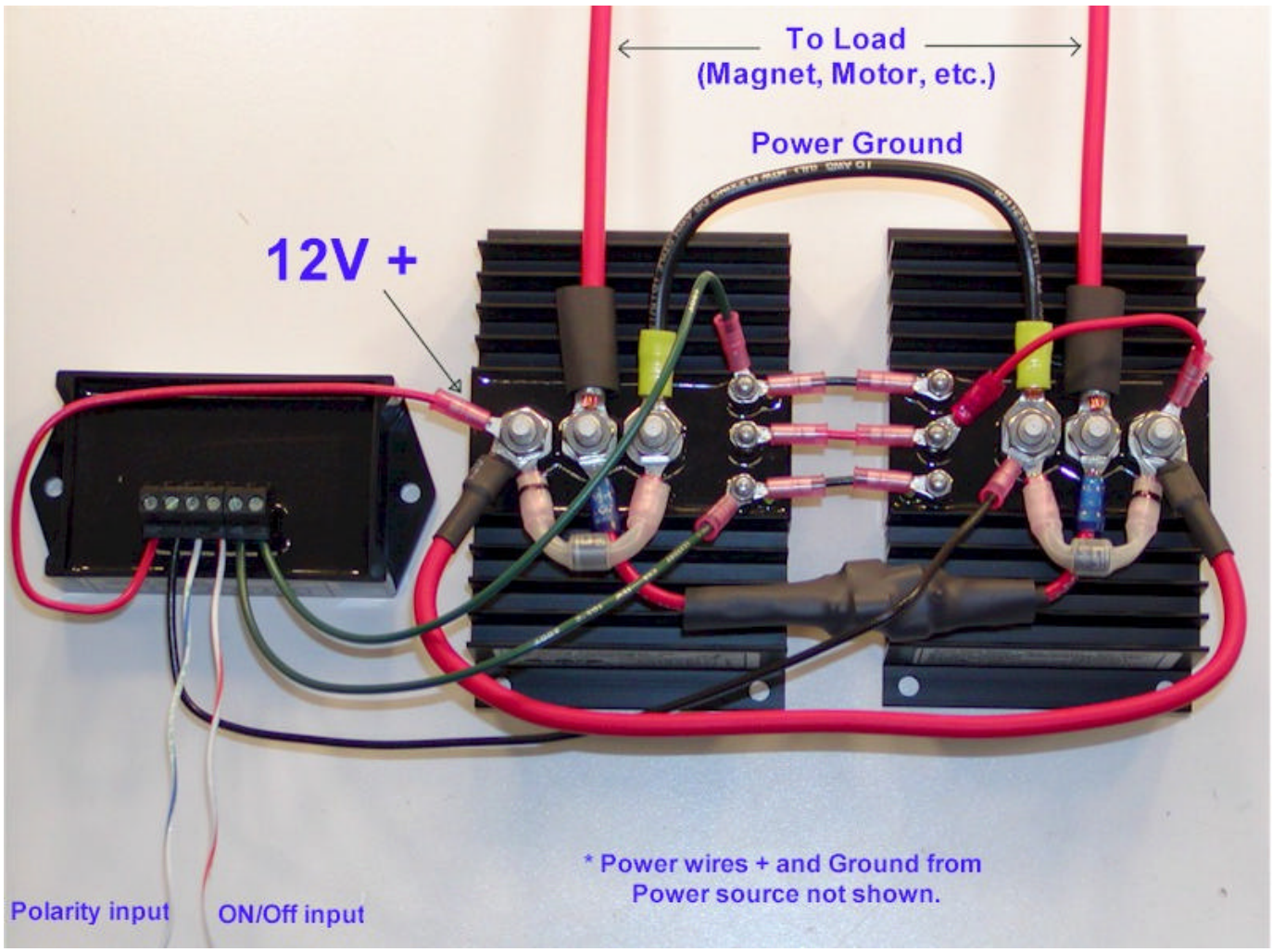
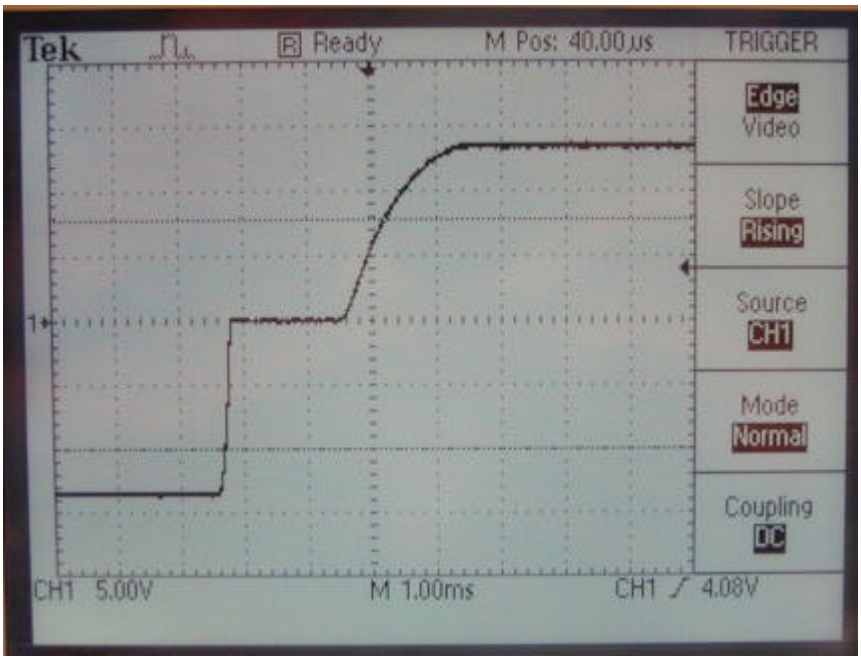



**Figure 1**

**SSR-75135N-30V-xxC**




This oscilloscope image below depicts a polarity logic change from a negative output to a positive output with the on/off logic being continuously ON. Note the delay between negative off to positive on. This inhibit and delay protection is built-in to the H-Bridge control module.

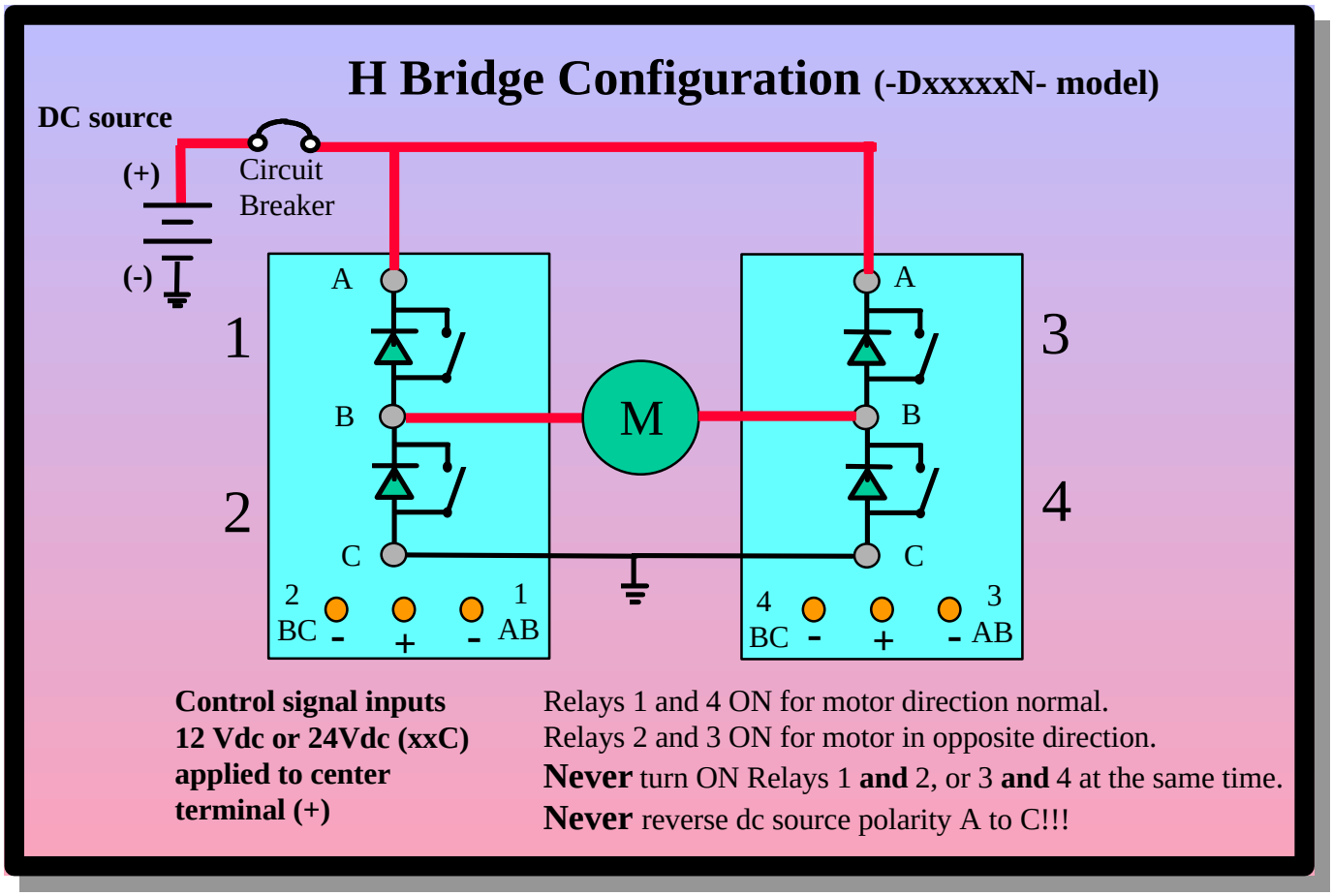



**Figure 2**

## H-Bridge Motor Control.

(Requires two each SSR-xxxxx**N**-xxV-xxC units.)

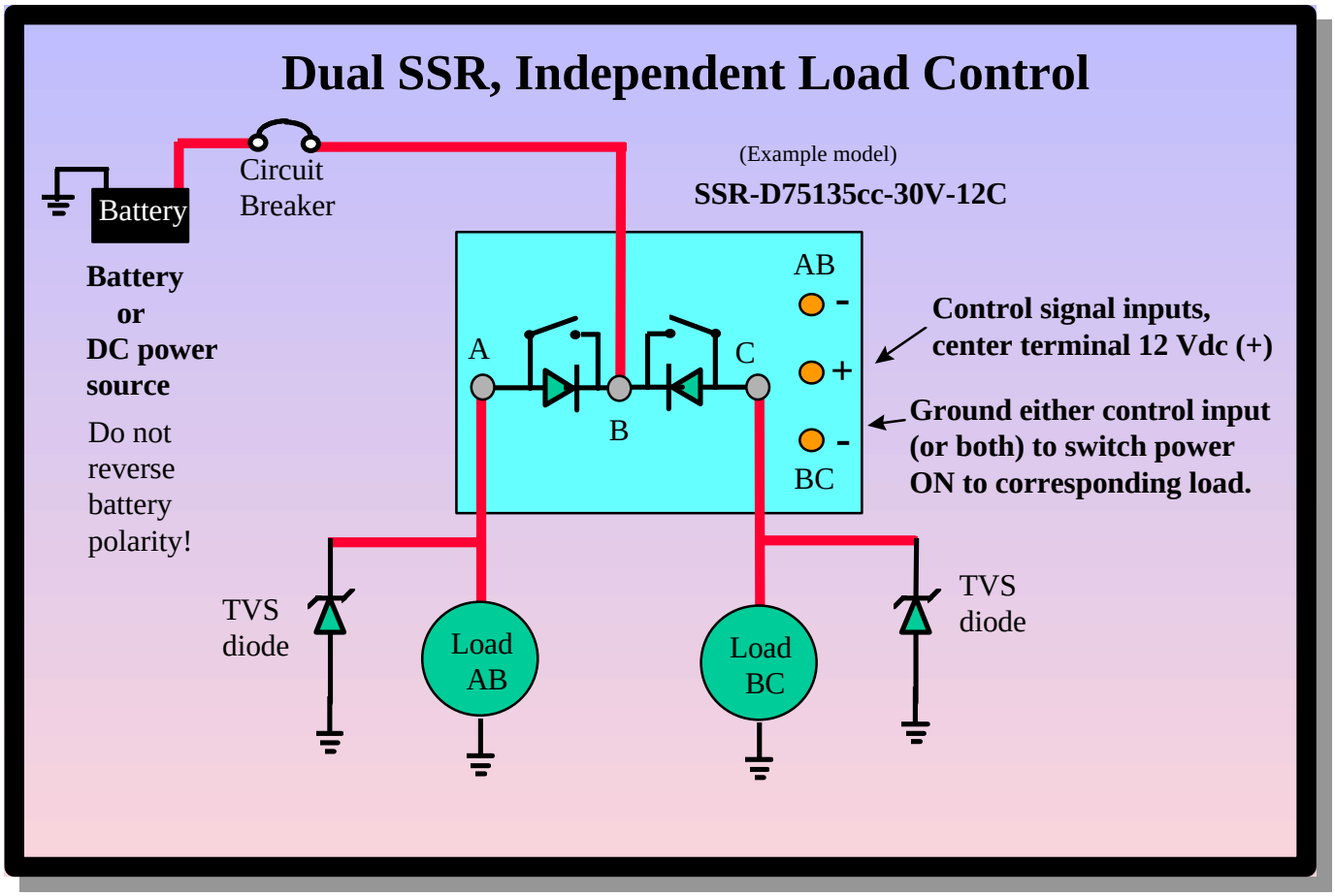
Some Possible Applications include:

**High current motor forward and reverse control.**
**Low Voltage Lift Magnets.**

## Basic Switching of dual load Applications, High Side with "cc" model:

**Diode suppression** for inductive loads is recommended for most applications. For installation, follow these steps:

1) For resistive or light inductive loads, Verify the load has diode suppression installed as illustrated. For highly inductive loads, larger TVS protection may be required depending on the inductive energy to be dissipated.
2) Connect the power source Positive (+) to terminal "B".
3) Connect a load to terminal A, or C, or both.
4) Connect control input positive to the center small terminal. Switch each SSR half by grounding the appropriate SSR control input. This sinks about 10 mA per SSR half. See the diagram.

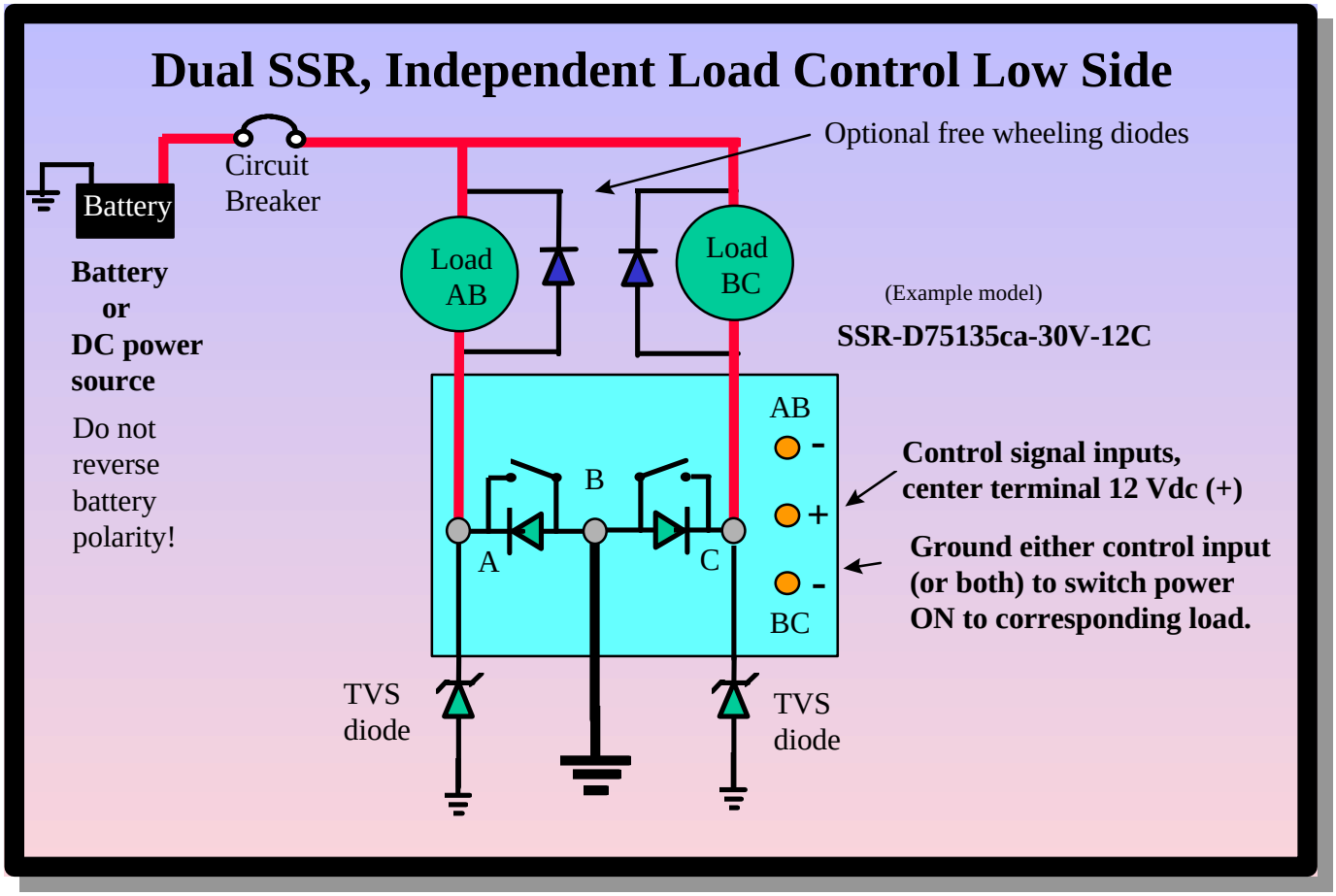



**Basic load switching of two independent loads (high side).**

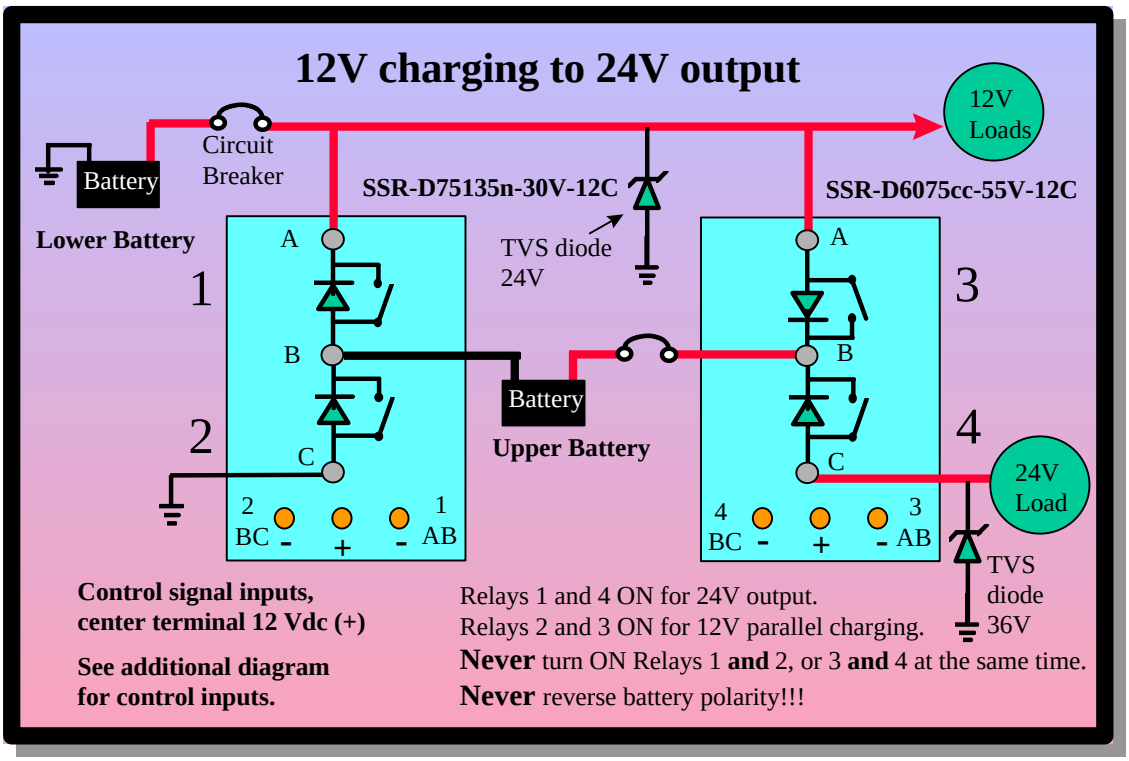
## Basic Switching of dual load Applications, Low Side with "ca" model:

**Diode suppression** for inductive loads is recommended for most applications. For installation, follow these steps:

1) For resistive or light inductive loads, Verify the load has diode suppression installed as illustrated either with TVS diodes or free wheeling diodes or both. For highly inductive loads, larger TVS protection may be required depending on the inductive energy to be dissipated.
2) Connect the power source Positive (+) to each load positive input.
3) Connect a load negative input to terminal A, or C, or both.
4) Connect the power source return (negative ground) to terminal "B" on the SSR.
5) Connect control input positive (12V nominal) to the center small terminal. Switch each SSR half by grounding the appropriate SSR control input. The control inputs sink about 10 mA per SSR half. See the diagram.




**Basic load switching of two independent loads (Low side).**




**12V charging with 24V output capability**

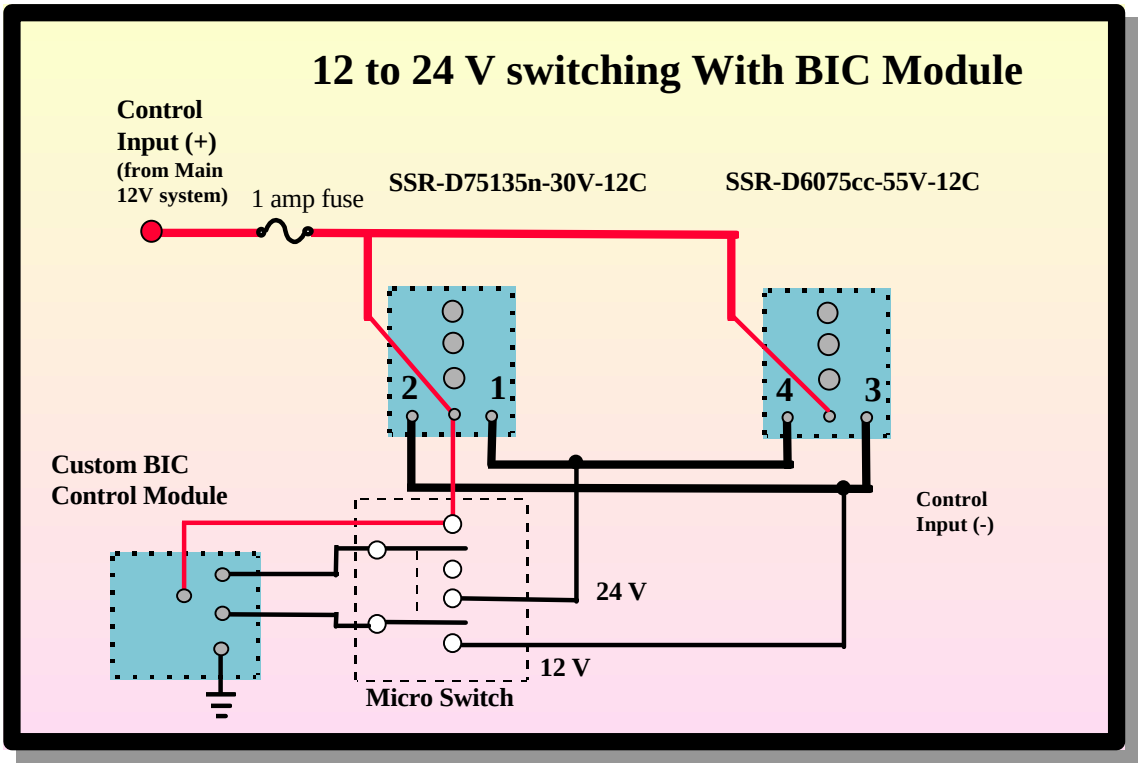



**Diagram for control inputs**

Use a double pole, three position switch. Center = all SSR's off and batteries are isolated. 24V position provides 24V output. 12V position (with BIC control module) provides automatic charging and isolation.

For other applications or possible setups, check our web site http://hellroaring.com for additional suggested configurations or other tips. If you have other questions you can send e-mail to sales04@hellroaring.com. Or check our website for the current valid e-mail address.

**Definitions:**

**Control Input:** These terminals, when connected grounded (and the positive control input is at a voltage of 9 to 16 volts (12V nominal) will cause the respective terminals B to A or B to C to electrically Combine (switch ON). These terminals, when open circuited, will cause the respective terminals to switch OFF. Input resistance is about 1000 ohms resulting in only 0.01 amps with a 12 Vdc control input. The input voltage (input current) has a direct effect on the turn on time. This is about 3 to 10 mS with a 12 Vdc control input.

**Terminals A, B, & C:** Terminals A to B and B to C can be switched independently. But, on "N" versions such as those used with the H-Bridge configuration, it is very important that appropriate measures be taken to ensure that Both are not switched ON at the same time when power and ground are applied to A and C. Our H-Bridge control Module includes about a 1 to 2 mS inhibit and prevents this condition. On "CC" versions, both loads can be ON at the same time.

**Dimensions:** 4.8" long, by 3.0" wide, by 2.0" to the top of the terminal studs.
**Weight:** **<** 12 Oz.

## Specifications:

| **SSR-D75135xx-30V-12C:** | | Unless specified **otherwise, ambient temp=25C**; max current from terminals "B" to either "A" or "C" each. |
|---|---|---|
| **Max voltage** | 30 Volts | continuous |
| Recommended operating voltage | < 20V | |
| | | |
| **Absolute Max ON Current** | 75 Amps | 100% duty cycle 65C ambient to 30 Vdc and 12 V control input. |
| | 135 Amps | 5% duty cycle 45C ambient 15 Vdc Source, 12 V control input. Max pulse width 5 seconds. |
| **Max On Resistance** (@ 10 amps) | 0.002 | Ohms terminal "B" to either "A or C" |
| | | |
| Control Input Current | 0.010 | Amps (with 12 Vdc input) typical |
| Control Voltage Range | 8 - 16 | Vdc (12V nominal) |
| | | |
| Switch on transient time Tr | 3-10 mS | typical, with 12 Vdc Control input |
| Switch off transient time Tf | < 0.3 mS | typical |

Note: Specifications are subject to change without notice.

# Standard Terms and Conditions of Sale

The sale of Hellroaring Technologies, inc. products shall be governed by the laws of the state of Montana. All sales shall transfer title within the state of Montana via common carrier. Hellroaring Technologies, inc. will not collect sales taxes for any other state. Should the unlikely event, a cause of action arises, buyer agrees that such action shall be held and governed in the state of Montana. The buyer recognizes that there exists inherent risks associated with batteries and installation & operation of battery devices. It is understood that any technical information published by Hellroaring Technologies, inc. including any installation instructions is of a general nature only and it is the user's responsibility to determine the proper application, installation, and operation of products. The buyer assumes all risk and agrees to indemnify Hellroaring Technologies, inc. against any and all causes for injury or damage to third parties that arises from use of such product.

# Return Policy

Should any single unit product sold by Hellroaring Technologies, inc. not meet or exceed your expectations, you may, within 30 days of our shipment to you, return such product for a full refund (credit on credit card orders) less a 15% restock charge, provided that:

a) You obtain an RMA number and provide your shipping address by calling customer service at 406 883-3801 or send an RMA request via e-mail (include the model #, serial number, and your phone number), and
b) The product, including all accessories, is returned in original and re-saleable condition, and
c) Units are Shipped (prepaid and insured for damage in transit) in the original or equivalent packaging, and
d) (optional) You include a simple note as to the reason for dissatisfaction. (This can help us improve our products)

For quantity orders, sales are final and our standard limited warranty applies.

# Limited Warranty

This Limited Warranty is extended to the original purchaser. Hellroaring Technologies, inc. warrants that our SSR products will be free from defects in materials and workmanship upon delivery. All claims for defects must be made within 30 days of delivery. The sole and exclusive remedy for failure of the product shall be for us, at our option, to repair or replace the product, to whatever extent we deem necessary to restore the product to proper operating condition. We may make replacements with new or functionally equivalent products of equal value. Should Hellroaring Technologies, inc. be unable to repair or replace the product within a reasonable time, we reserve the right, at our option, to issue a refund or credit of the purchase price in lieu of repair or replacement. We reserve the right to assess a $15 fee for units returned and proven not to be defective. To obtain warranty service you must:

1) Call Customer Service at 406-883-3801 for a Return Material Authorization (RMA) number and shipping address. Or send an RMA request via e-mail (include the model #, serial number, and your phone number and your return shipping address)
2) Return the product in the original or equivalent packaging (Shipping prepaid and insured for damage in transit), together with the RMA number AND a description of the problem. Include your return shipping address and your phone number.

Do not attempt to disassemble, or otherwise tamper with any of the 4 nuts on the bottom of each unit. Doing so will void this limited warranty.
For quantity orders, extended warranty for switching applications may be available on an application specific basis at slight extra cost.

# Exclusions

This Limited Warranty is made expressly in lieu of and to the exclusion of any and all warranties, express or implied, oral or written, including, without limitation, any and all implied warranties of merchantability or fitness for a particular purpose, and all such other warranties are expressly disclaimed. This Limited Warranty shall not be applicable to failures of the product that result from accident, abuse, misapplication or alteration, improper installation or maintenance, unauthorized repair attempts, operation or attempts to operate it beyond its mechanical, chemical, thermal, or electrical capacity intentionally or otherwise, and we assume no liability as a consequence of such events under the terms of this warranty. Hellroaring Technologies, inc. shall not be liable for any special, indirect, incidental, consequential, exemplary, or punitive damages for claims in any claim, action, suit or proceeding arising out of the purchase, use or performance of the product, and whether or not it has been advised of the possibility of such damages. The foregoing allocation of risk is reflected in the price of the product. Nor shall there be any liability thereunder for claims of labor, loss, profit, goodwill, repairs or other expenses incidental to the repair or replacement of such product.

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