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DALF Application Note #002

Dalf/Simple-H Hookup

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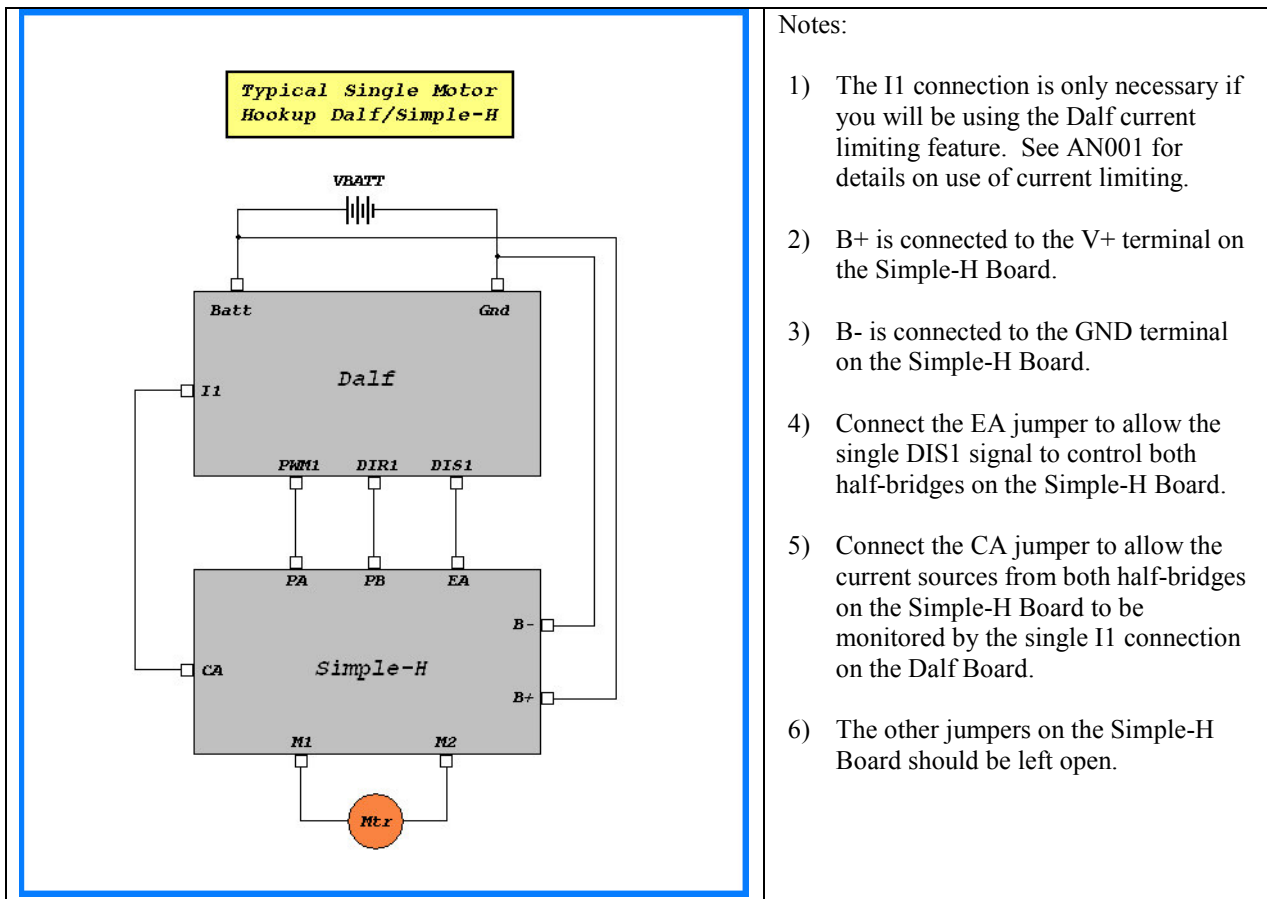
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1 Application Note Synopsis

The Simple-H is an Electronic Speed Controller Board sold by Robot Power Inc. (<http://www.robotpower.com/>). This application note discusses the typical hookup and configuration settings when using a Simple-H Bridge ESC Driver Board with the Dalf Motor Control Board to control a single motor. The addition of a second Simple-H Driver allows control of a second motor with similar hookup and configuration. **The Simple-H Driver may only be used with Dalf Boards having Firmware Version ≥ 1.50 .** If you have an earlier version of the Dalf Firmware, your board will have to have the upgrade in order to use the Simple-H Driver.

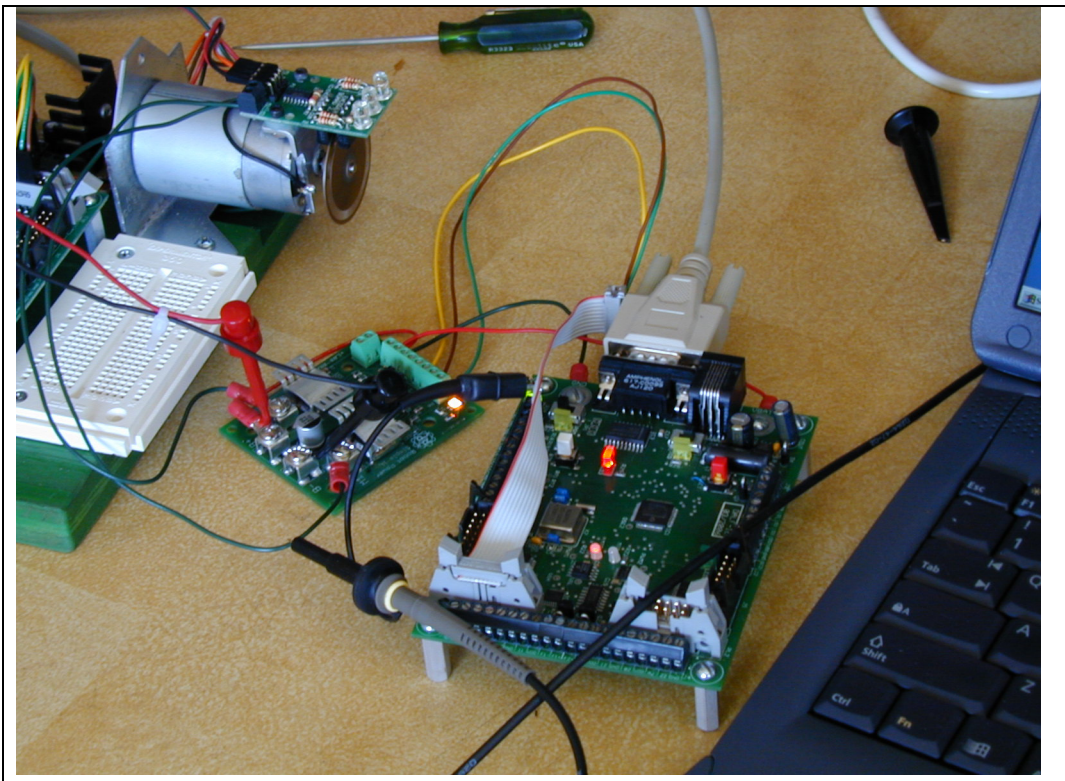
2 Hookup



3 Picture (During Test)

Here is a picture showing the Dalf Board hooked up to an early prototype of a Simple-H Board during testing. Obviously this is not an elegant hookup but it serves to illustrate an implementation of the previous hookup diagram.

In this photo the current sensing line from the Simple-H is not connected to the Dalf Board. The 3 wires (yellow=PB, brown=EA, green=PA) are connected to the (DIR1, DIS1,PWM1) Dalf Terminals thru the ribbon cable. The system is being supplied with a +12 V power supply that is not shown, but you can see the clips connecting the supply to the B+ and B- terminals on the Simple-H. A pair of wires (green=GND, red=V+) running from the Simple-H to the Dalf Board Terminals (GND, VBATT) are supplying power to the Dalf Board. The M1 and M2 lines run over to the small +12V motor mounted on a test board. The small board and wheel on the motor implement an optical encoder which is not hooked up to the Dalf Board in this photo.



4 Configuration

There are a couple of Dalf Configuration Settings which you should be aware of when using the Simple-H Board.

dis_activelo

The disable signals for the half-bridge drivers on the Simple-H are active low. These signals are tied together with the EA jumper and routed on the board to the EA connector. This signal is then connected externally via a wire to the DIS1 signal on the Dalf Board. Because the factory default logic level for the DIS1 signal on the Dalf Board is active hi, the Dalf Configuration must be changed to let the Dalf Firmware know that the ESC driver being used expects this signal to be driven active low. This is accomplished by setting the “dis_activelo” bit in the Motor Parameter Block. Since the factory default for the “dis_activelo” bit is clear, this will need to be changed. See the Dalf Owner’s Manual for details about changing motor parameters.

osmc

Some ESC Driver boards contain logic that uses the DIR control signal to actively control motor direction while others simply route this signal to the half-bridge input and depend on the Motor Controller to manipulate the motor control signals in such a way to achieve proper motor reversal. The OSMC product and the Simple-H are of the latter variety and require the “osmc” bit to be set in the Motor Parameter Block. Since the factory default setting for the “osmc” bit is set, you shouldn’t need to do anything here. See the Dalf Owner’s Manual for details about changing motor parameters.

ocie, oc_fastoff

If you plan on using the over current detection features on the Dalf Board you will need to understand the purpose of the “ocie” and “oc_fastoff” settings. The “ocie” (Over Current Interrupt Enable) bit will need to be set in order to enable the over current detection feature on the Dalf Board. The factory default setting for the “ocie” bit is clear, so this will need to be changed in order to use the feature. Additionally, Dalf supports two types of over current response in the firmware, but only the FastOff option may be used with the Simple-H Board, so the “oc_fastoff” bit will need to be set to select this option. Since the factory default setting for the “oc_fastoff” bit is set, you shouldn’t need to do anything here. See the Dalf Owner’s Manual for details about changing motor parameters.

VL,VH

The VL and VH voltage thresholds define the over current limits for your application. You will only need to be concerned about these if you plan on using the over current detection feature provided by the Dalf Board. See the Application Note “AN001: Current Sensing” for a discussion of how to use the VL and VH levels for current sensing with the Simple-H. See the Dalf Owner’s Manual for details about changing motor parameters (the mechanics of how to change the values of VL and VH).