# DRV30/S

## C R H Electronics Design

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## 3.0A Stepper motor drive board for System4 or stand alone driver

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## Specifications

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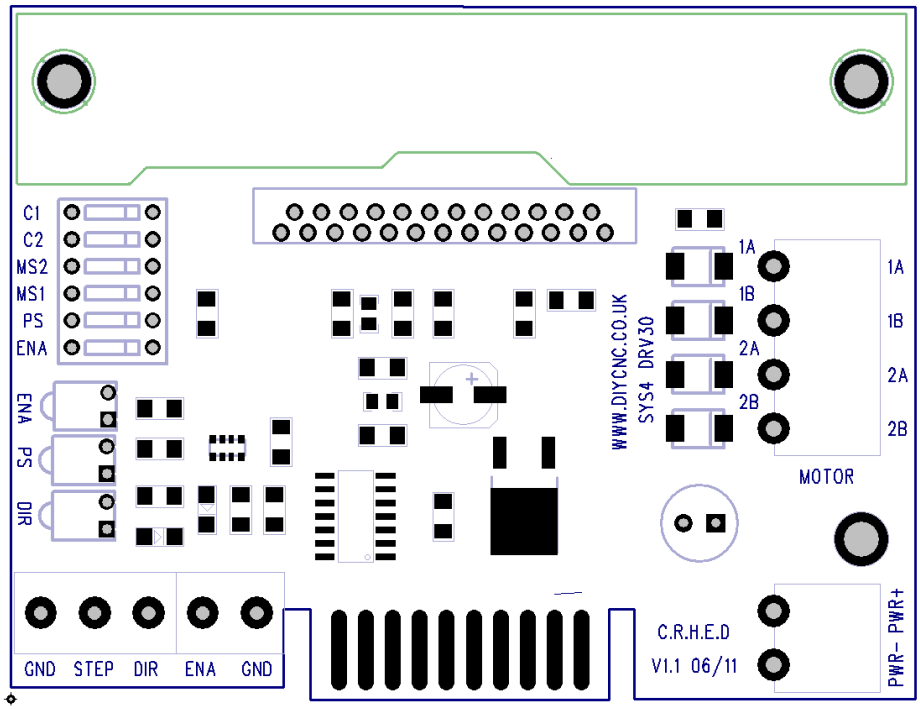
- Two phase PWM operation.
- Uses internal synchronous rectification to reduce board size and heat dissipation.
- 1/16, 1/8, 1/2 or full Step selectable.
- Works direct from PC Parallel port connections
- Switch selectable stepper current, 100% , 75%, 50% & 20%
- Power save mode runs at 20% holding power
- Step, Direction and Enable inputs.
- Uses single supply line (24V -30V DC regulated supply recommended)
- LED indicator display of Direction, Enable and Power save on DRV30.
- Board size 85 X 65 mm. FR4, immersion gold, 2oz copper, RoHS compliant.
- Un-pluggable power connection and vertical mounting on DRV30.
- This board is available as a standalone driver DRV30 with vertical mounting or plug-in System4 module DRV30S.

**Manual V1.1 June 11**
**Hardware V1.1 June 11**

Board layout, of DRV30/S




The DRV30 is a new stepper motor drive board and is available as standalone or System4 module driver. The Fingers are used for the System4 module driver board with a 4 way switch enabling settings for current and micro steps. The new design incorporates full power save control which reduces power consumption of the board when there are no stepper signals present. As soon as a step signal is detected the board returns to normal power conditions and no external control line is needed. A 6 way dipswitch gives control of enable, power save, current and micro steps. Both versions of the board have an aluminium heat sink and the DRV30 has slots for vertical mounting with 100mm centres.

**Dip switch settings**

MS2 & MS1 Adjust Step rate.
(MS2 off MS1 off) 1/8th Step
(MS2 on MS1 off) 1/2 Step
(MS2 off MS1 on) 1/16thStep
(MS2 on MS1 on) Full Step

C1 & C2 Control maximum stepper current

| | |
|---|---|
| (C1 on C2 off) | 50% (1.5A) |
| (C1 on C2 on) | 100% (3.0A) |
| (C1 off C2 off) | 20% (0.6A) |
| (C1 off C2 on) | 75% (2.25A) |

| | |
|---|---|
| PS | (ON enables power save mode) |
| ENABLE | (ON overrides enable logic input and enables board output) |

Note: that the System4 version of the board DRV30S has only a four way dipswitch, power save and enable signals are handled on the main motherboard.

**Power Input**

Maximum input voltage 30V, recommended regulated voltage 24-30V although the board will actually run down to 12Volts this will impair performance at higher step rates.

If using an unregulated power supply, check peak voltage across output before connecting DRV30 board. A 25V unregulated supply can have 35V peak unloaded output. Power is supplied to the board via the two pin plug.

**Signal Inputs**

The board has three inputs, Step, Direction and Enable plus two ground connections.

**Enable** is active low, if using external control you need to release the dip switch setting for overriding it. (Switch needs to be on if left unconnected)

**Step** takes pulses from the computer or controller to initiate rotation of the motor.

**Direction** is a logic level that alters the direction of motor rotation.


DRV30S FOR SYSTEM4

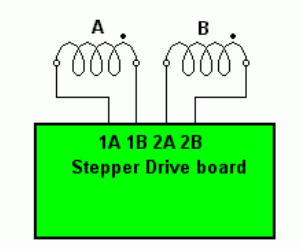
**Stepper motor connections**

The following diagrams show typical connections for a range of different motors. If your motor rating is in excess of the 3.0A maximum current limit then you should use the windings in serial connection for maximum efficiency.

## 4 leads - Bipolar Drive

**4 Leads**
The standard connection for a four lead motor.

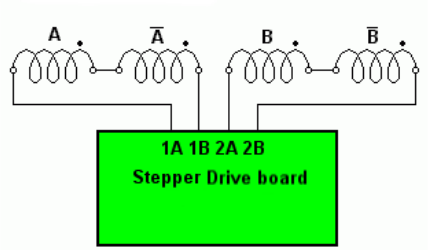
This is the standard connection for a bipolar drive. There are still four windings and, depending on motor type, they are in series or parallel. Most manufacturers makes two models with the same winding, but one time connected is series and one time in parallel.




## Bipolar Drive - Serial Connection

**6 Leads**
The windings are connected in serial. Since most 6 lead motors are wound bifilar - link -, so the inductance will be quadruple of the single winding value.

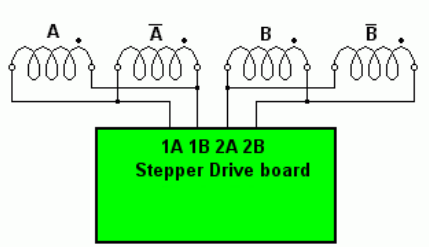
**8 Leads**
The windings are connected in serial. Since most 8 lead motors are wound monofilar - link -, then the inductance will be double. If the motor was wound bifilar - link -,the inductance will be quadruple .




## Bipolar Drive- 8 leads - Windings Parallel

**8 Leads**
This is the standard high speed connection for an eight lead motor.

With the windings in parallel, the motor current can be higher whilt the inductance is lower. This is a typical connection for a motor that need to run at a high speed..

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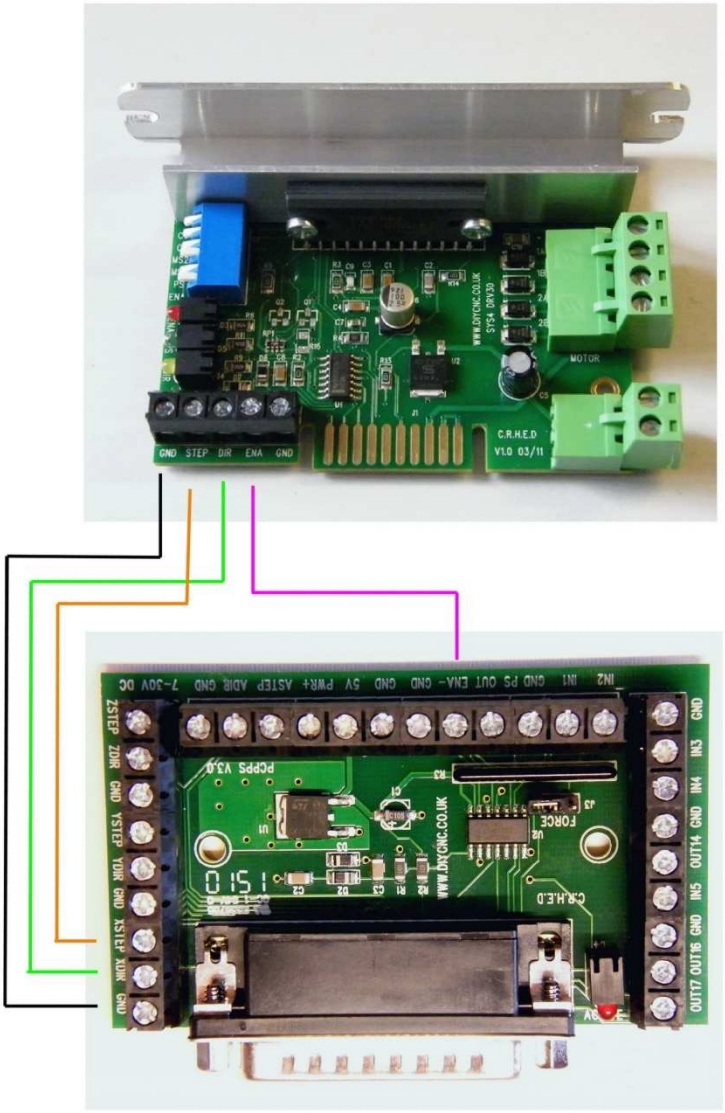
**IMPORTANT:**

Double check that connections are correct before applying power to the board, windings connected out of phase may cause damage to the board. Do not connect or disconnect wires with the power on. It is a good idea to set the current switch settings to minimum, to limit the current if you are in any doubt of the connections.

**The PCB Stepper outputs on the DRV30/S board are marked 1A &1B this represents one winding. Outputs 2A & 2B are the other winding.**




This circuit diagram shows a connection to a PCPPS V3 board on the X axis, only four connections are required. You may use any other parallel breakout board. If you breakout board does not support the enable line then this can be achieved with the on board dip switch and leaving this input unconnected. Simply repeat these connections for Y, Z, A as required.

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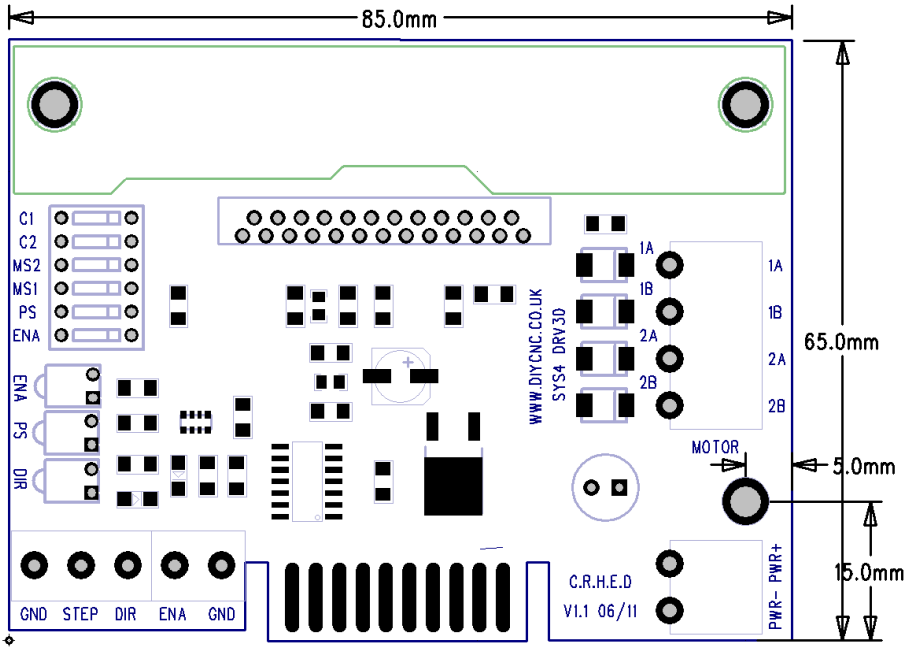


Dimensions for board and fixing. Hole diameters are 3.2mm for M3 bolts

DRV30 bolt down heat sink has 98-100 mm fixing centres and M4 fixing.