UnoDrive Hardware Manual

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1 UnoDrive

1.1 Features

The UnoDrive is a single axis stepper motor driver. It receives step and direction signals from the controller. It can drive motors with up to 40 volts to maximize the high speed performance. The UnoDrive motor driver can be used in conjunction with our OPTISTEP PLUS^{tm} products or with any controller capable of producing TTL compatible step and direction signals.

The features of the UnoDrive include:

- Selectable full-step or half-step operation.
- Bipolar chopper circuit to provide the highest performance.
- Generates minimal heat and in most applications does not require a fan.
- Overcurrent and over temperature protection .

1.2 Configuration

Jumper **J1** selects the stepping mode operation for the UnoDrive. As shipped, the UnoDrive is set for half step operation (This results in 400 logical steps per revolution on a standard 1.8^{o} motor). The current is set via resistors R8 and R11 which are the larger power resistors. The value is .33 Ohm for a current setting of 1.2 amp. You may use a larger value resistor for a smaller current. If you need a different current setting you will need to obtain the proper value resistors (1 watt minimum) for you application. It is possible to up the amperage to 1.5A, but hsi may lead to overheating of the board and is not always desirable. To determine the resitor value, use the following formula:

R = 0.415 / motor current

For example to get 350 ma, 0.415/0.35 = 1.186 OHM

Choose the standard value that is next highest or in this case 1.2 OHM.

1.3 Specifications

Electrical Specifications

Drive circuit	Bipolar chopper
Chopping rate	20 KHz nominal
Operating voltage range	10 ~ 40 VDC
Output Current	1.2 Amp per phase max continuous
Stepping Mode	Half step / Full step selectable
Current cutback	Automatic after 1 second of idle
Step signals	1 TTL compatible positive edge trigger
Direction signals	1 TTL compatible
Physical dimensions	4.1" W x 2.325" D x 1.25" H
Working temperature range	32^{o}F ~ 158^{o} F (0^{o} C ~ 70^{o} C)

2 Installation

2.1 Installation & Wiring

1) Plug the 5 pin male circular DIN connector from the motor into H1.
2) Connect power, ground, and step and direction into H2 (see table 2 below for pin outs). Two wiring diagrams are shown in Appendices A and B.

Table 1 - H1 Connections

Pin	Function
1	A
2	NC
3	B-
4	A-
5	B

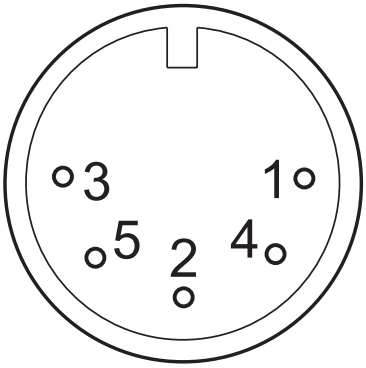
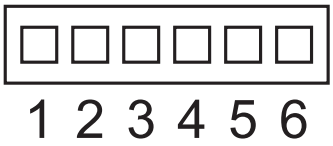


Table 2 - H2 Connections

Pin	Function
1	Vmm
2	Ground
3	Ground
4	+5VDC
5	Step
6	Direction



3 Motor Wiring Diagrams

3.1 4 Lead motor connection

Four lead motors must be connected as shown in Figure 3.1.

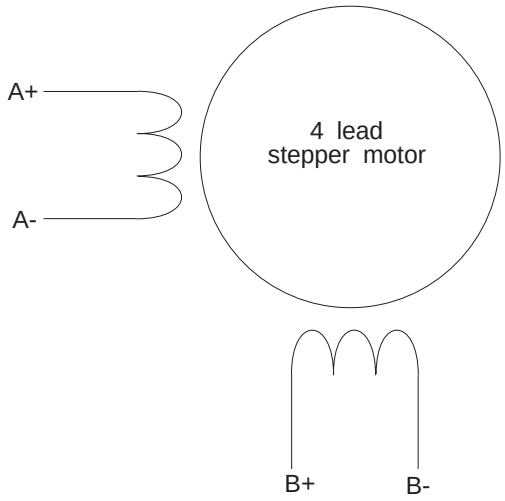


Figure 3.1 - 4 Lead Motor Connection

3.2 6 Lead motor connection

Six lead motors can be connected in two configurations, center tap and series. In center tap mode (Figure 3.2), the motors will run at their normal current and torque ratings. In series mode (Figure 3.3), the motors will have greater low end torque ratings but will not run as fast as center tapped motors. In series mode, the motors should also be run at only 70% of their rated current to prevent over heating.

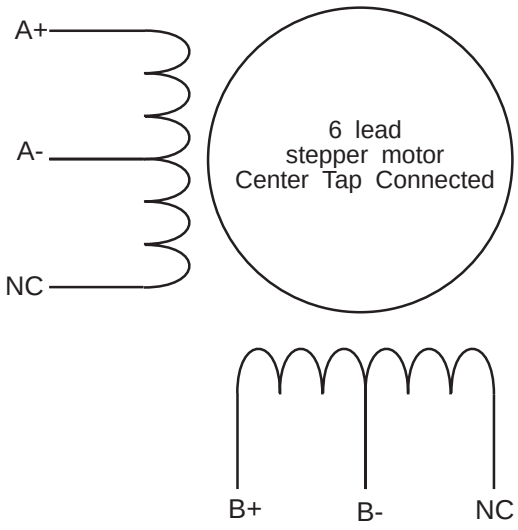


Figure 3.2 - 6 Lead Center Tapped

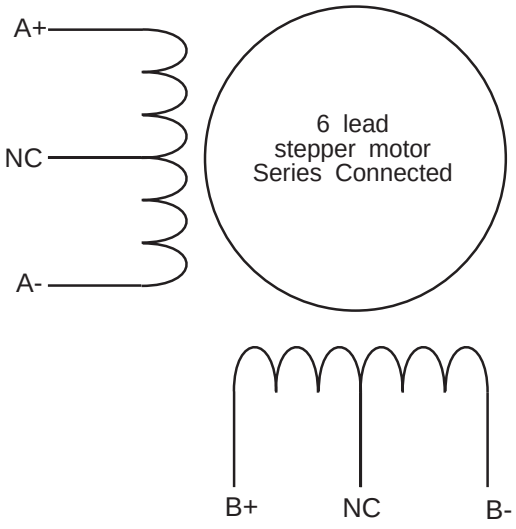
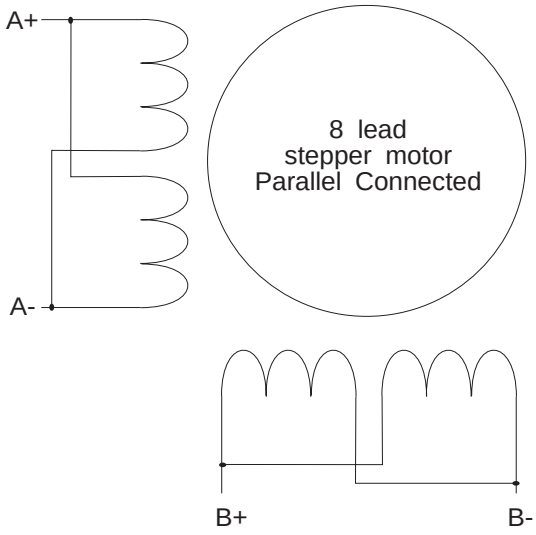


Figure 3.3 - 6 Lead Series

3.3 8 Lead motor connection

Eight lead motors can be connected in three configurations, parallel, series, and two of four windings. In parallel mode (Figure 3.4), the motor will run at 140% of its normal current rating, and will provide higher torque at higher speeds.



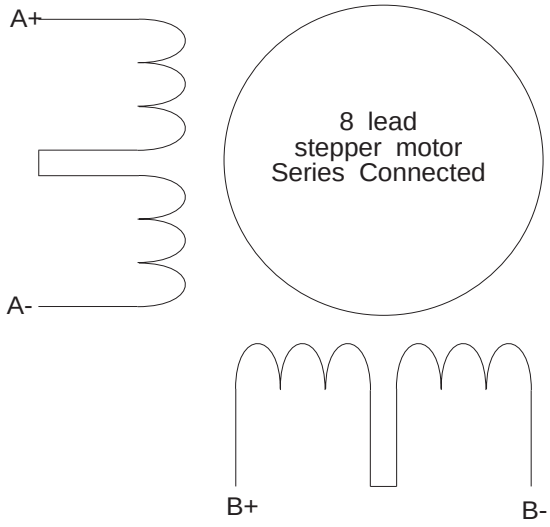


Figure 3.4 - 8 Lead Parallel Connected **Figure 3.5 - 8 Lead Series Connected**

In series mode (Figure 3.5), the motor will have greater torque capability at low speeds but the torque will drop off sharply as speed increases. In series mode, the motors should be run at only 70% of their rated current to prevent over heating. The half coil method (Figure 3.6) uses only half of the windings available on the motor and should be driven at the rated current for the motor.

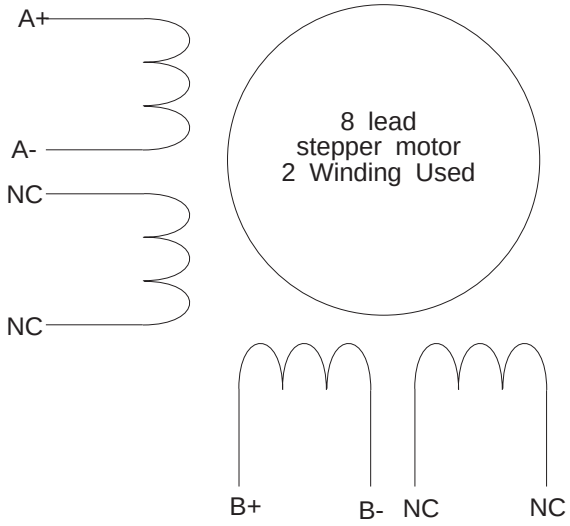


Figure 3.6 - 8 Lead Half Coil

4 Technical Support

Should you need help in identifying and correcting a problem, the MicroKinetics engineering staff is ready to assist you during business hours. You should refer to the documentation and verify any described adjustments before calling. Be prepared to supply the model number of all components and any software and/or dip switch or jumper settings.

4.1 How to Obtain Technical Support

Technical support is available as follows:

Via Email
Email MicroKinetics with a description of problem symptoms to helpdesk@microkinetics.com where it is reviewed and answered daily.

Via Fax
Fax a detailed description of the problem to 770-422-7854 including your fax and voice number. An engineer will call to help you.

Via Telephone
Call our main line directly and request Hardware Tech Support. The number is 770-422-7845.

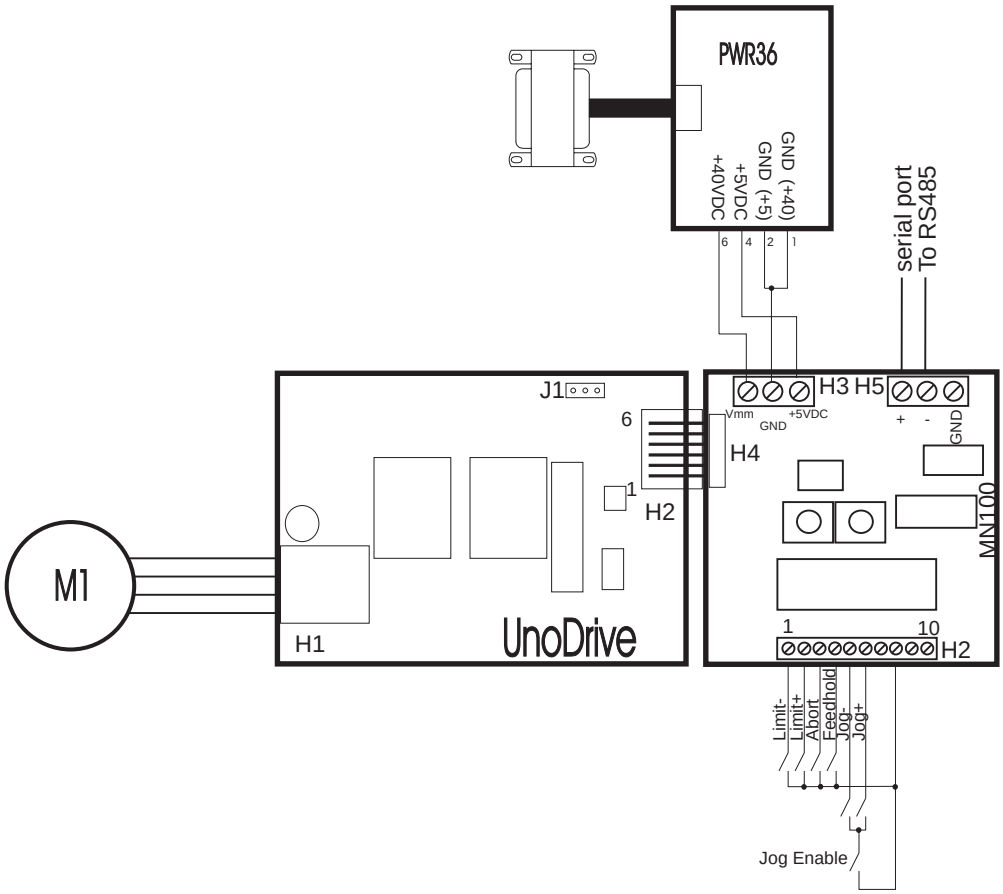
4.2 Product Return Procedure

The technical support staff can determine if the problem requires returning the product for testing and can give you an RMA (Return Merchandise Authorization) number to write on the outside of the package for proper routing. This improves repair turnaround time.

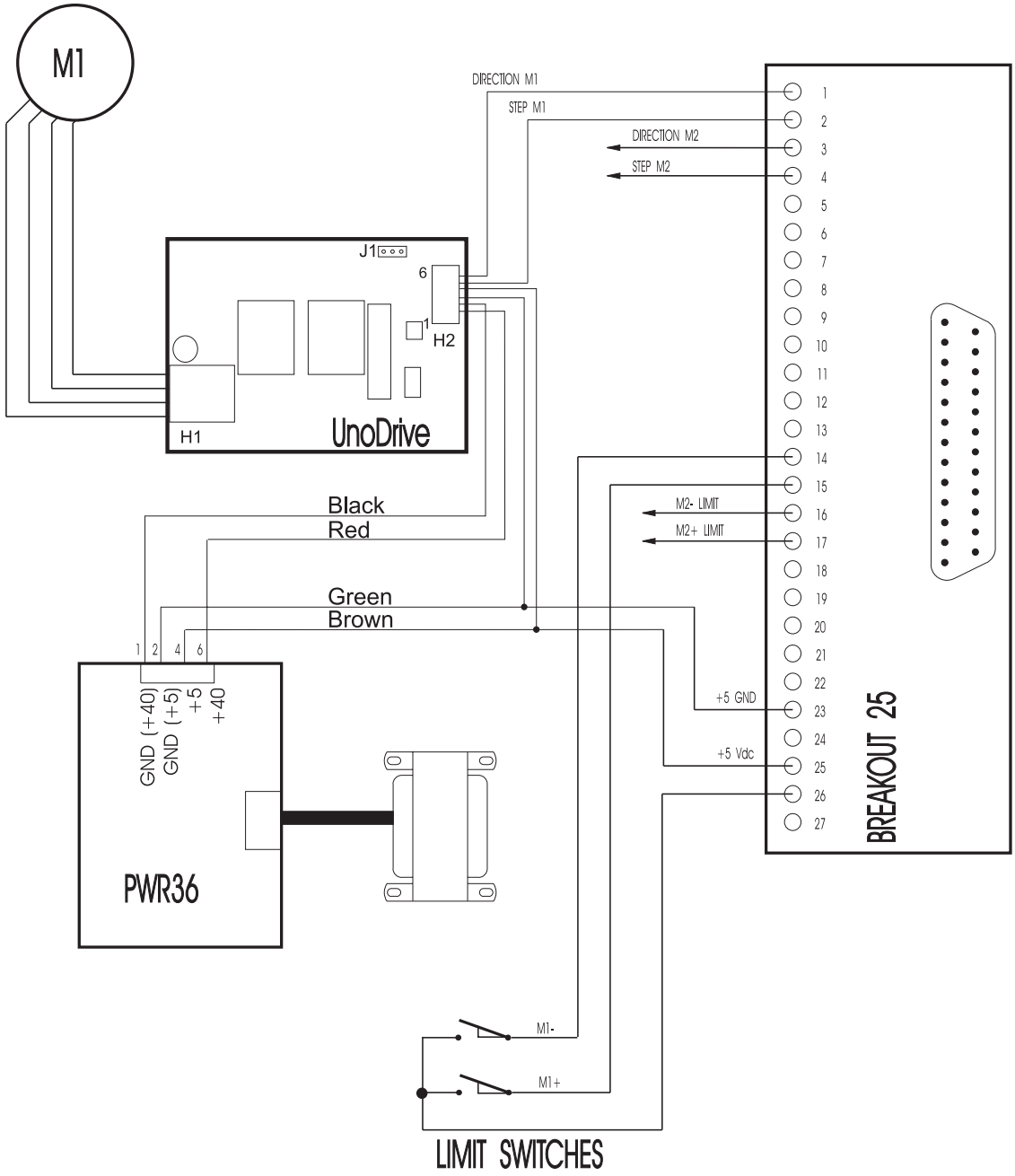
When returning an electronic product, always pack in the original antistatic bag. If original packaging is not available, wrap in aluminum foil and place in container to withstand shipping and handling. Always insure product with shipping company for full value.

If a product is returned to us for repair, is tested and found to operate within the rated specifications, a nominal testing fee will apply. Please inquire as to the testing charge at the time you obtain the RMA number.

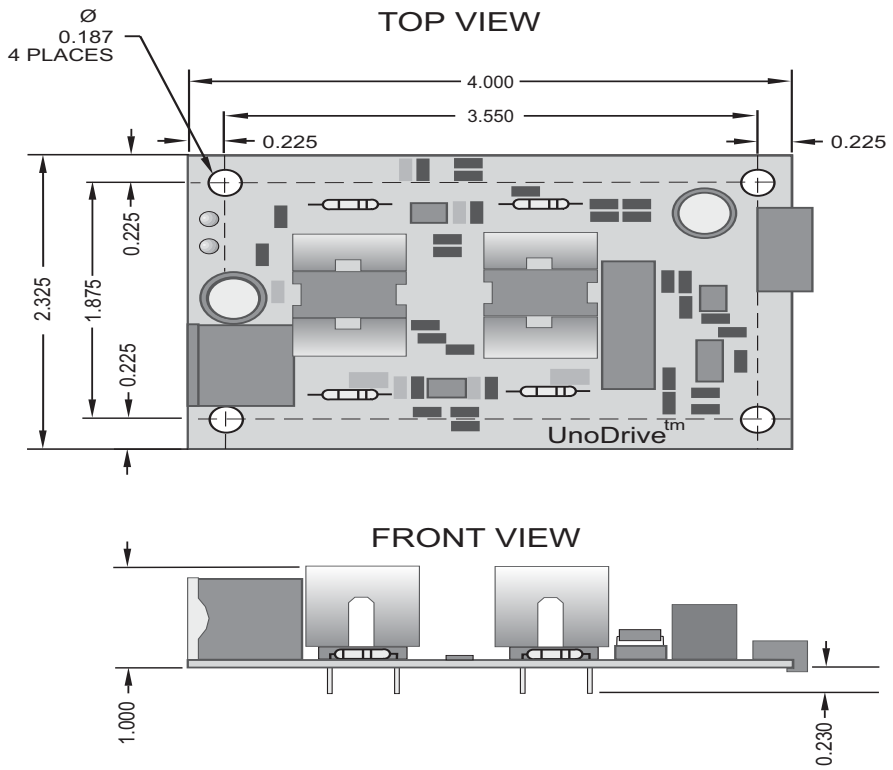
Appendix A - Typical Wiring Diagram with MN100



Appendix B - Typical Wiring Diagram with OptiStep Plus



Appendix C - Mechanical Specifications



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