

HIGH PERFORMANCE MICROSTEPPING DRIVER

The STPMDRV-404 is a high performance, low cost microstepping driver that incorporates advanced surface mount and ASIC technology. The STPMDRV-404 is small, easy to interface and use, yet powerful enough to handle the most demanding applications.

The STPMDRV-404 has 14 different resolutions both in binary and decimal built into the driver.



The development of proprietary circuits has minimized ripple current while maintaining a 25 KHz chopping rate.

This prevents additional motor heating that is common with drivers requiring higher chopping rates. Now low inductance stepper motors can be used to improve high speed performance and system efficiency.

Features

- Low Cost
- 12 - 40 VDC Input Power
- High Output Current, 3 Amps RMS, 4 Amps Peak
- No Minimum Inductance
- Resistor Programmable Current Adjustment
- Optoisolated Inputs, Step, Direction, Enable, Reset
- Step Frequency up to 5 MHz
- 25 KHz Chopper Drive
- Status Indicator - Axis ON
- Operating Temperature, 0 - 70 C at Heatsink

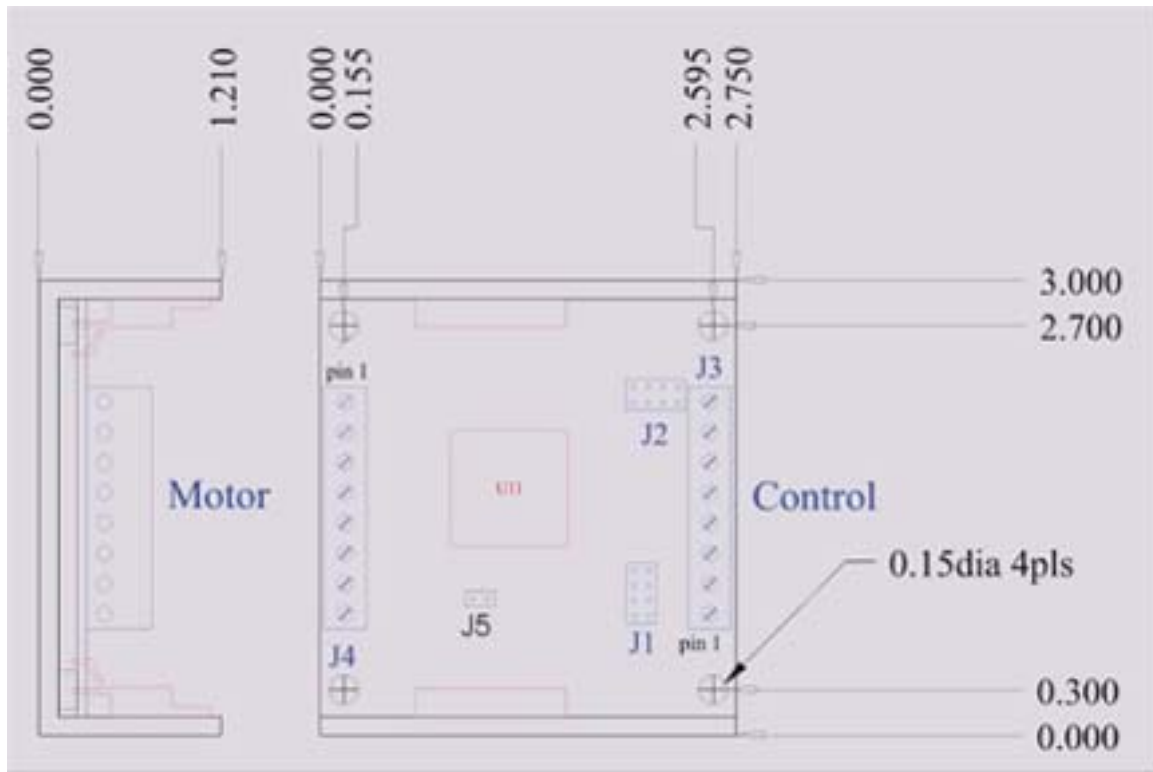
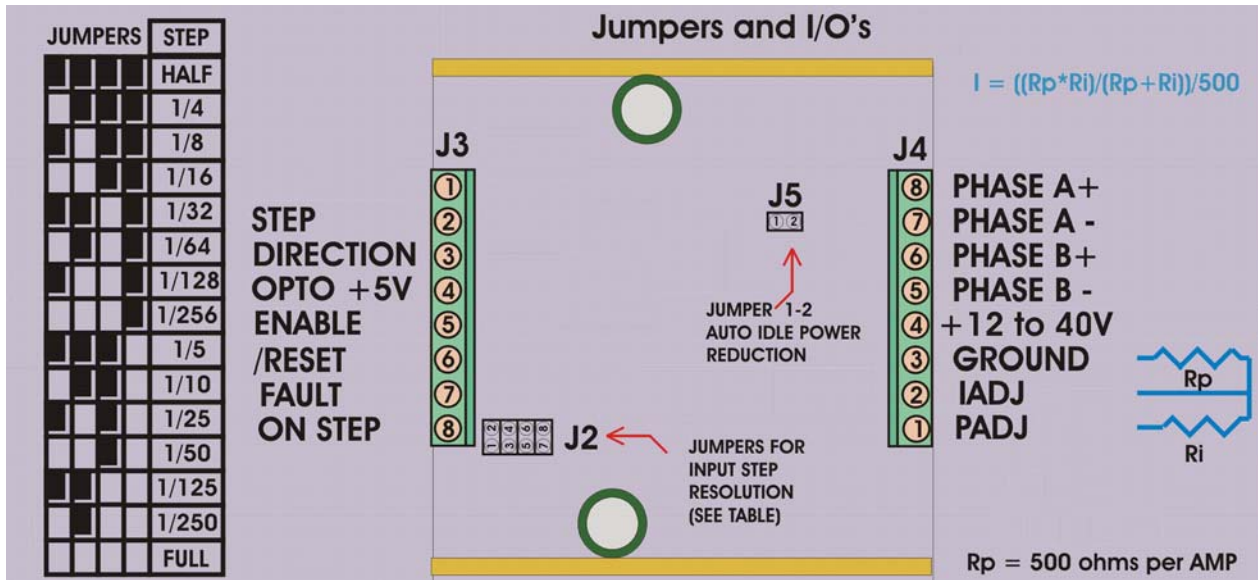
Features C'ntd

- Crystal Controlled Clock
- Over Temperature Protection
- Automatic Current Reduction, 0.5 Sec After Last Step Input
- 14 Selectable Resolutions Both in Decimal and Binary
- Microstep Resolutions: 1/2 1/4 1/5 1/8 1/10 1/16 1/25 1/32 1/50 1/64 1/125 1/128 1/250 1/256
- Extremely Small Size, 2.75" (69.9 mm) X 3.00" (76.2 mm) X 1.20" (30.5 mm)



Optimal Engineering Systems, Inc.
6901 Woodley Avenue
Van Nuys, California 91406 U.S.A.
www.oesincorp.com

+1 (818) 222-9200
FAX +1 (818) 222-9580
E-mail sales@oesincorp.com



Optimal Engineering Systems, Inc.
6901 Woodley Avenue
Van Nuys, California 91406 U.S.A.
www.oesincorp.com

+1 (818) 222-9200
FAX +1 (818) 222-9580
E-mail sales@oesincorp.com

CONNECTION	SIGNAL	DESCRIPTION
J3 - 1	+5V USER	This is a +5V 100ma output power source for user application. It is the same supply that is used to power the logic in the module and is derived via a switching power supply from the +12 to +40 VDC input supply to the module. It is short circuit protected and current limited. However if shut-down occurs because of user loading the driver will also quit working. If the outputs FAULT and ON STEP are to be used to drive opto-isolators in the user equipment, this supply should be used for the positive input to the opto with the negative input connected to the signal. Twisted pair should be used to give maximum noise immunity.
J3-2	STEP	The STEP input is an opto-isolated signal. The positive input to the opto-isolator is connected to the OPTO +5V (J3-4) with a 390 ohm series resistor. The input must be driven to ground by a device that can sink at least 8 ma at 0.4V. The stepping action of the driver is triggered by the positive edge of the step pulse.
J3-3	DIRECTION	The DIRECTION input is an opto-isolated signal. The positive input to the opto-isolator is connected to the OPTO +5V (J3-4) with a 390 ohm series resistor. The input must be driven to ground by a device that can sink at least 8 ma at 0.4 V. A high input or open input cause clockwise rotation of the motor. For CW rotation Phase A goes positive and Phase B goes negative starting at zero.
J3-4	OPTO +5V	The OPTO +5V input is the common connection to all of the OPTO inputs of the module. For best noise immunity this should be connected to the User's +5V logic power supply that is being used by the driving source thru one conductor of each of the input signals twisted pair for optimum noise immunity. For connection to PLC and other equipment using 24 V logic you must connect this input in the same fashion to the +24 V logic power supply. In addition 2k ohm resistors need to be put in series with all of the inputs (user driver outputs).
J3-5	ENABLE	This opto-isolated input when OPEN or HIGH enables the driver, turning on the Motor phase currents. When held low the motor drive outputs are disabled and disconnected from the motor. When the driver is disabled it is safe to connect or disconnect a motor without damaging the driver.
J3-6	/RESET	This opto-isolated input when OPEN or HIGH leaves the driver in an operating state. If the signal is brought LOW, the driver is reset to initial starting conditions which will reset the motor phases to 0 degrees (Phase A = 0 amps Phase B = Max amps)
J3-7	FAULT	This is a non-isolated output which when HIGH (+5 V) indicates a fault condition within the driver. Normally this signal will remain LOW at all times (<0.4 V). There is also an onboard LED indicator which will be lit when the driver is OK, and extinguishes when a fault occurs. A normal fault condition might be caused by a motor wiring short circuit triggering the electronic circuit breaker. To reset the fault condition, either a RESET must be asserted, or the power to the module turned off then back on again.
J3-8	ON STEP	This is a non-isolated output when LOW indicates the start of each full step of the motor (0, 90, 180, and 270 degrees phase currents).



CONNECTION	SIGNAL	DESCRIPTION
J4-1	PADJ	This pin is used for connection to the idle current reduction programming resistor, the other end of which is connected to IADJ (J4-2). Idle Current (Amp) = $((R_i * R_p) / (R_i + R_p)) / 500$ where R_i is the idle current resistor and R_p is the programmed current resistor.
J4-2	IADJ	This pin is used for programming the current of the driver. A positive one milliamp current source is injected into this connection so that a resistor connected to ground from this pin will set a current control voltage. On the standard 4 amp maximum drivers the driver current is 2 amps per volt on this pin, or when a resistor is used 500 ohms per amp. The return pin for the resistor should be connected to the GND (J4-3) pin.
J4-3	GND	This pin is used for the negative connection of the driver power supply. The heatsink of the driver is also connected to GND.
J4-4	PWR	This pin should be connected to the positive output of the driver power supply. The maximum voltage applied should not exceed +40 VDC. This +40 VDC includes any increase in the supply voltage due to re-generation from the motor. If you do not take this into account, the voltage may be exceeded during deceleration of the motor or crashing and driver failure will occur.
J4-5	PHASE B-	Motor Phase B negative connection.
J4-6	PHASE B+	Motor Phase B positive connection.
J4-7	PHASE A-	Motor Phase A negative connection.
J4-8	PHASE A+	Motor Phase A positive connection. Note to reverse motor direction you can just swap Phase A or Phase B plus and minus connections.



Optimal Engineering Systems, Inc.
 6901 Woodley Avenue
 Van Nuys, California 91406 U.S.A.
www.oesincorp.com

+1 (818) 222-9200
 FAX +1 (818) 222-9580
 E-mail sales@oesincorp.com

LIMITATION OF LIABILITY

Optimal Engineering Systems, Inc. (OES) hardware and software products are not intended or authorized for use in any manner where human life or safety is at risk. OES' products are not intended for life support equipment.

In no event shall Optimal Engineering Systems, Inc. be liable to any customer for costs or damages, including lost profits, lost savings or other incidental or consequential damages arising out of the use or inability to use such products even if Optimal Engineering Systems, Inc. or an authorized Optimal Engineering Systems, Inc. representative has been advised of the possibility of such damages, or for any claim by any other party. In any event, Optimal Engineering Systems liability arising in any manner in connection with the products, whether based in contract, product liability or tort, shall not exceed the purchase price of the product.

LIMITED ONE-YEAR WARRANTY

Optimal Engineering Systems, Inc. warrants to the original purchaser that this product to be free from defects in material or workmanship for a period of one year from date of purchase. Optimal Engineering Systems, Inc. agrees to repair any such defect or exchange the product with a new or equal replacement. Defective product must be returned to Optimal Engineering Systems, Inc. in the original package, postpaid. This warranty is void for any product that has been modified by the customer in any way. If failure of the Product has resulted from accident, abuse, or miss-application, Optimal Engineering Systems, Inc. shall have no responsibility under this One-Year Warranty.



Optimal Engineering Systems, Inc.
6901 Woodley Avenue
Van Nuys, California 91406 U.S.A.
www.oesincorp.com

+1 (818) 222-9200
FAX +1 (818) 222-9580
E-mail sales@oesincorp.com