



G250X STEP MOTOR DRIVE

REV 2: July 14, 2010

GECKODRIVE, INC.
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(714) 832-8874

Thank you for purchasing the G250X drive. The G250X microstep drive is warranted to be free of manufacturing defects for 1 year from the date of purchase. Anyone who is dissatisfied with it or is unable to make it work will be cheerfully refunded the purchase price if the G250X is returned within 15 days of the purchase date and is in like-new condition.

PLEASE READ FIRST BEFORE USING THE G250X

Before beginning, be sure to have a suitable step motor, a DC power supply suitable for the motor and a current set resistor. The motor's rated phase current must be between 0 amps and 3.5 amps and the current set resistor may be a 1/4 watt, 5% part. Finally have a STEP and DIRECTION pulse source available.

G250X PIN WIRING

The G250X uses a 30 pin male or female header. It is required to have a suitable breakout board with a mating connector and is not recommended to be used without one as the drive is not optically isolated.

- | | |
|-------------------|---|
| PINS 1-4 | Power Ground
Connect the negative (black) lead of your power supply to these pins. |
| PINS 5-8 | Power (+)
Connect the positive (red) lead of your power supply to these pins. It must be between +15VDC to +50VDC. |
| PINS 9-12 | Motor Phase A
Connect one end of your "Phase A" motor winding here. |
| PINS 13-16 | Motor Phase /A
Connect the other end of your "Phase A" motor winding here. |
| PINS 17-20 | Motor Phase B
Connect one end of your "Phase B" motor winding here. |
| PINS 21-24 | Motor Phase /B
Connect the other end of your "Phase B" motor winding here. |
| PIN 25 | Current Set
Connect one end of your current set resistor to this pin with the other end going to pin 30. |
| PIN 26 | Reserved
Do not use. |
| PIN 27 | Direction
Connect the DIRECTION signal to this pin. |
| PIN 28 | Step
Connect the STEP signal to this pin. |
| PIN 29 | Disable
This pin will force the winding currents to zero when shorted to ground (PIN 30). |
| PIN 30 | Common
Connect this to your logic (controller) ground as well as your current set resistor. |

POWER SUPPLY CONNECTION

- | | |
|-----------------|---|
| PINS 1-4 | Power Ground
Connect the power supply ground to these pins |
| PINS 5-8 | Power (+)
Connect the power supply "+" to these pins |

The power supply voltage must be between 15VDC and 50VDC. The maximum power supply current required is 67% of the motor's rated phase current. An unregulated power supply may be used as long as the voltage stays between the limits; keep the ripple voltage to 10% or less for best results.



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CAUTION! Power supply voltage in excess of 50VDC will damage the G250X.

CAUTION! Never put a switch on the DC side of the power supply! This will damage, if not destroy, your drive!

A very accurate calculation of power supply voltage is to find your motor's inductance, and put it into the following equation.

$$32 * (\sqrt{\text{mH inductance}}) = \text{Power Supply Voltage}$$

If your motor has 2mH of inductance, the equation would look as follows.

$$32 * (\sqrt{2}) = 45.12\text{V}$$

In the example above 45.12V is the maximum voltage for that specific motor; any voltage above this will create unnecessary heating and any voltage below that will get you proportionally less speed than you could otherwise get at 45.12V.

CURRENT SET RESISTOR

PIN 25 Current Set
Connect the current set resistor to this pin.

PIN 30 Common
Connect the other end of the current set resistor to this pin.

This input programs the G250X's current output to the motor windings. The current set resistor is a linear calculation of 1K ohms of resistance for every amp of motor winding current. This means that a 2.3A per phase motor will require a 2.3K ohm resistor on PIN 25 and PIN 30. If your motor is 3.5A or above you can leave these PINs open and the drive will self limit to 3.5A; however, you will lose the auto current reduction feature of the drive. If you require this feature then a 3.5K resistor should be put on the drive.

MOTOR CONNECTION

PINS 9-12 Phase A
Connect one motor winding to these pins

PINS 13-16 Phase /A
Connect the other end of the winding to these pins

PINS 17-20 Phase B
Connect the other motor winding to these pins

PINS 21-24 Phase /B
Connect the other end of the winding to these pins

Connect one motor winding to PINS 9-12 and PINS 13-16. Connect the other winding to PINS 17-20 and PINS 21-24. Turn the power supply off when connecting or disconnecting the motor. If the motor turns in the wrong direction, reverse the motor winding connections to PINS 9-12 and PINS 13-16.

CAUTION! Do not short the motor leads to each other or to ground; damage will result to the G250X.

4-wire, 6-wire and 8-wire motors may be used. When 6-wire motors are used, they may be connected in half winding or full winding. This is equivalent to an 8-wire motor connected in parallel or series. If a motor is connected in series or full winding, the motor's phase current rating is half of its parallel or unipolar rating. The choice depends on the high-speed performance required; a parallel-connected motor will provide twice the power of a series-connected motor at the same power supply voltage.

STEP AND DIRECTION INPUTS

PIN 27 Direction
Connect the DIRECTION line to this pin.

PIN 28 Step
Connect the STEP line to this pin.



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These pins can be driven with 3.3V or 5V logic. If 3.3V logic is used then the input current is -1mA for logic "0" and zero for logic "1". If 5V logic is used then the input current is -1mA for "0" logic and 0.67mA for logic "1".

DISABLE PIN

PIN 29 Disable
This pin will force the winding currents to zero when shorted to ground (PIN 30).

Shorting this input to ground (PIN 30) forces winding currents to zero and stops all output switching activity. The G250X will continue totalizing step and direction inputs if any are sent. The power supply current drops to less than 15mA. The motor will return to its original position when the disable input is released if no step pulses have been sent and the motor has not been moved more than 2 full steps.

COMMON PIN

PIN 30 Common
Connect this pin to the controller signal ground

HEATSINKING

The G250X needs heatsinking for current settings greater than 3 amps. The case temperature (measured on the bottom plate) should not exceed 70 degrees C, and for best life should be kept to 50 degrees C or less. Use heatsink compound between the G250X and the heatsink.

CAUTION! Current settings above 3 Amps without a heatsink will result in damage to the G250X.

The drive must be heatsinked to a piece of aluminum, preferably with fins and a fan to increase heat dissipation and surface area. Do not screw the drive directly to the door of your control cabinet, as this will typically not provide adequate heatsinking properties. Be sure to isolate the drive from the heatsink if it is not hard anodized; the heatsink available for purchase from Geckodrive is a piece of hard anodized aluminum and does not require any special isolation. If you do not use one of these you must use Kapton tape to isolate the MOSFETs from any conductive surface.

ADJUSTING THE TRIMPOT

This trimpot adjusts the motor for the smoothest possible low-speed operation. Set the motor speed to about 1/4 revolution per second, and then turn the trimpot until a distinct null is noted in the motor's vibration. This will result in the most even microstep placement for a given motor and power supply voltage.

DISCLAIMER

CERTAIN APPLICATIONS USING POWER PRODUCTS MAY INVOLVE POTENTIAL RISKS OF DEATH, PERSONAL INJURY OR SEVERE DAMAGE TO PROPERTY. GECKODRIVE INC. PRODUCTS ARE NOT DESIGNED, AUTHORIZED OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT DEVICES OR OTHER CRITICAL APPLICATIONS. INCLUSION OF GECKODRIVE INC. PRODUCTS IN SUCH APPLICATIONS IS UNDERSTOOD TO BE FULLY AT THE PURCHASER'S OWN RISK.

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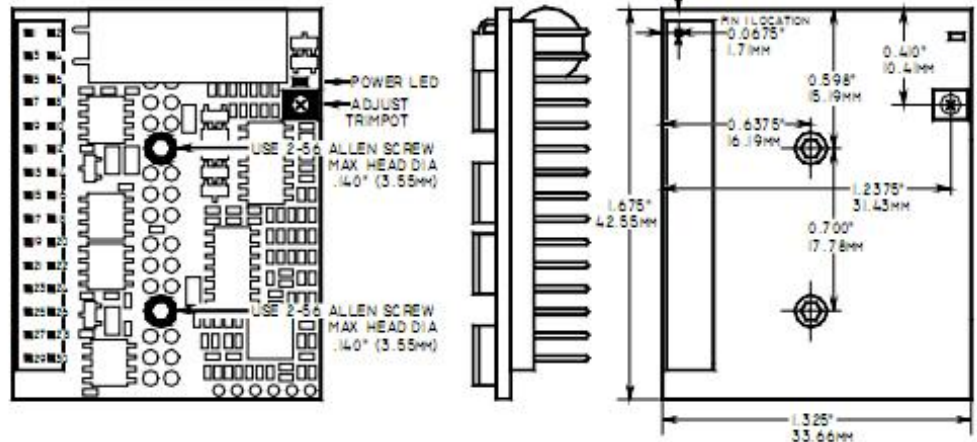
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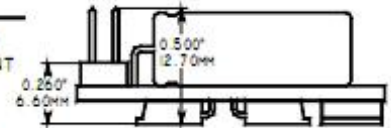
MAIN CONNECTOR:

1 GND	2 GND
3 GND	4 GND
5 +VDC	6 +VDC
7 +VDC	8 +VDC
9 PHASE A	10 PHASE A
11 PHASE A	12 PHASE A
13 PHASE /A	14 PHASE /A
15 PHASE /A	16 PHASE /A
17 PHASE B	18 PHASE B
19 PHASE B	20 PHASE B
21 PHASE /B	22 PHASE /B
23 PHASE /B	24 PHASE /B
25 I-SET	26 DO NOT USE
27 DIRECTION	28 STEP
29 DISABLE	30 SIGNAL GND

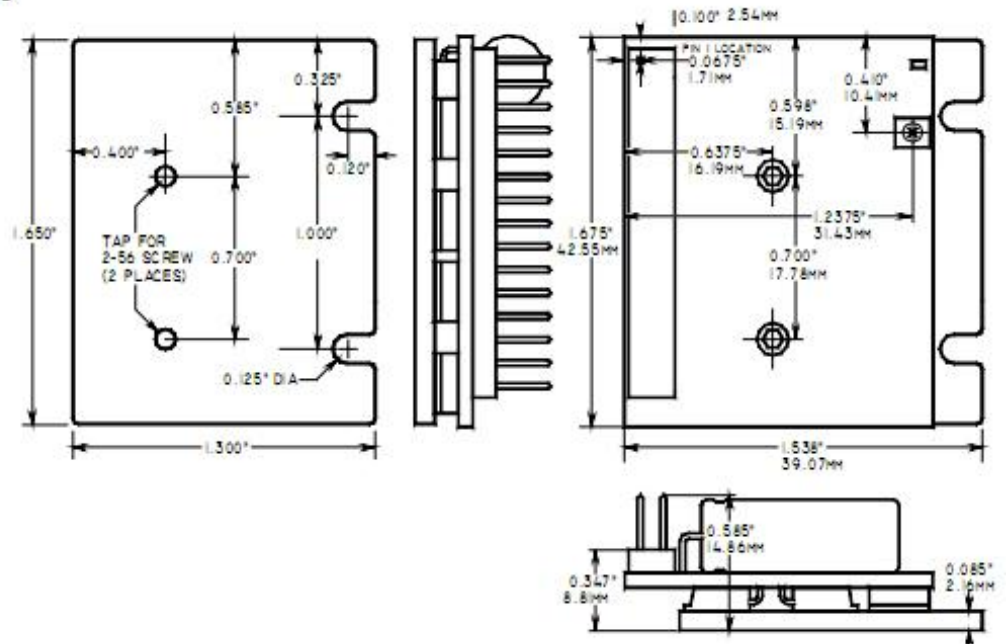


SPECIFICATIONS:

SUPPLY VOLTAGE	+15VDC MIN, +50VDC MAX	STEP PULSE WIDTH	1 MICROSECOND MIN
PHASE CURRENT	0A TO 3.5A	AUTO STANDBY	70% OF SET CURRENT
I-SET RESISTOR	1.000 OHMS PER AMP	MID-BAND RESONANCE COMPENSATION	
POWER DISSIPATION	3.3W AT 3.5A AND 50VDC	MICROSTEP TO FULL STEP MORPHING	
RESOLUTION	10 MICROSTEPS PER FULL STEP	12A, 60V DISCRETE N-CHANNEL MOSFETS	
STEP/DIR INPUT	0V TO 3.3V MIN, 0V TO 5V MAX	1.675" X 1.325" X 0.500" SIZE	
STEP/DIR CURRENT	1mA	WEIGHT	0.45 OZ (12.5 GRAMS)
STEP PULSE RATE	0Hz TO 300kHz	TEMPERATURE	0C TO 75C



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