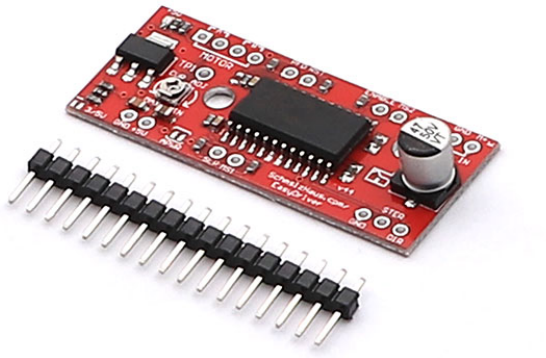
Stepper Motor Driver 0.75A

User Manual



Instructions:

Each Easy Driver can drive up to about 750mA per phase of a bi-polar stepper motor. It defaults to 8 step micro stepping mode. (So if your motor is 200 full steps per revolution, you would get 1600 steps/rev using Easy Driver.) This setting can be easily overridden by tying the MS1 and/or MS2 pin to ground to set the driver to use 1/8, 1/4 or 1/2 micro step mode (See the datasheet for the table of values). It is a chopper micro stepping driver based on the Allegro A3967 driver chip. It has a variable max current from about 150mA/phase to 750mA/phase. It can take a maximum motor drive voltage of around 30V, and includes on-board 5V regulation, so only one supply is necessary.

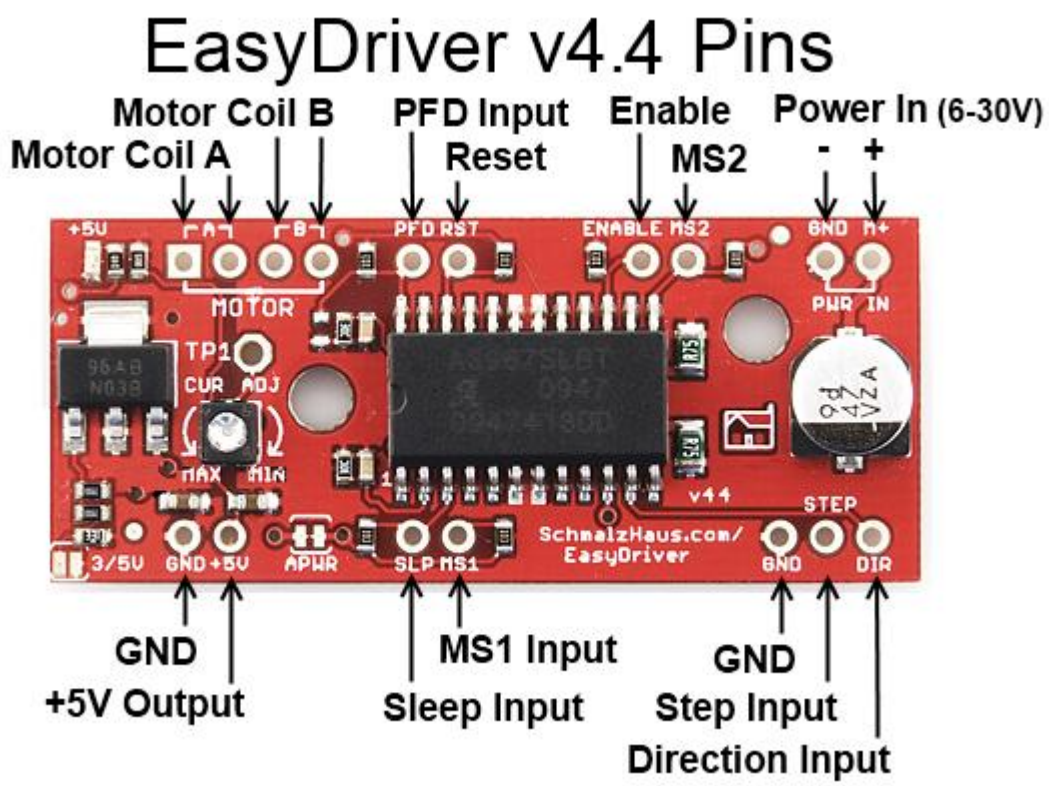
Pin Description:

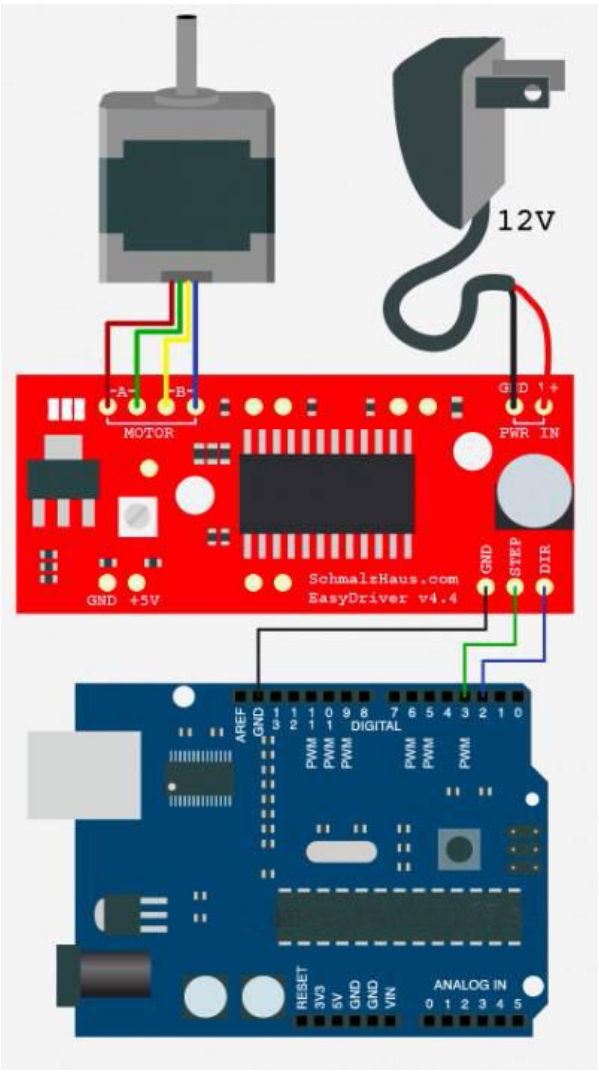
- GND : There are three GND (Ground) pins on the Easy Driver. They are all connected together inside the board. Connect the negative side of your power supply, as well as from any other boards you are using to drive the Easy Driver to one or more of the GND pins.
- M+: This is the power input to the Easy Driver. Connect this to the positive power supply lead. This should be a 6V to 30V, 2A (or more) power supply that is clean (low ripple).
- A and B: (four pins) these are the motor connections. See below diagrams for how to hook these up. A and B are the two coils of the motor, and can swap the two wires for a given coil (it will just reverse the direction of the motor). Make CERTAIN that this connection to the motor is solid, and NOT through a connector that has any chance of intermittent contact (which will fry the motor driver chip).
- STEP: This needs to be a 0V to 5V (or 0V to 3.3V if you've set your Easy Driver that way) digital signal. Each rising edge of this signal will cause one step (or micro step) to be taken.
- DIR (Direction): This needs to be a 0V to 5V (or 0V to 3.3V if you've set your Easy Driver up that way) digital signal. The level if this signal (high/low) is sampled on each rising edge of STEP to determine which direction to take the step (or micro step).

That's it - those are the only signals that you absolutely need to connect to anything. All the rest below are optional - in other words, the Easy Driver sets them to reasonable default values.

- MS1/MS2: These digital inputs control the micro stepping mode. Possible settings are (MS1/MS2): full step (0, 0), half step (1, 0), 1/4 step (0, 1), and 1/8 step (1, 1: default).
- RST (reset): This normally high input signal will reset the internal translator and disable all output drivers when pulled low.
- SLP (sleep): This normally high input signal will minimize power consumption by disabling internal circuitry and the output drivers when pulled low.
- ENABLE: This normally low input signal will disable all outputs when pulled high.

- PFD: This one is complicated - please see the datasheet for more information. We default it to slow decay mode, but you can over-ride with your own voltage on this pin. (or by populating R17)
- 5V: This is an OUTPUT pin that will provide either 5V (default) or 3.3V from the voltage regulator, at a small amount of current (say 50mA - depends on input voltage) to power a circuit that you may need powered.





EasyDriver v4.4

An easy to use bipolar stepper motor driver
Use 4 wire, 6 wire or 8 wire steper motors
From about 150mA/phase to about 750mA/phase
Defaults to 5V for Vcc (logic supply), settable to 3.3V
Supply 8V to 30V DC power input on JP1
Do not connect or disconnect motor
whlie EasyDriver is powered

DEFAULT OPTIONS
Short JP5, JP6, JP7 pins
to GND or Vcc to override

SLEEP = Vcc (awake)
MS1 = Vcc (1/8 microstep)
MS2 = Vcc (1/8 microstep)
ENABLE = GND (enabled)
RESET = Vcc (not reset)
PFD = Vcc (slow decay mode)

JP5: 2 SLEEP, 1 MS1
JP6: 2 MS2, 1 ENABLE
JP7: 2 RESET, 1 PFD

DIR is level sensitive
A rising edge on STEP
causes a step
Both take 0V to Vcc

JP2: 3 DIR, 2 STEP, 1 GND

Coil 1 of motor across
OUT1B and OUT1A
Coil 2 of motor across
OUT2B and OUT2A

JP3: 4 OUT1B, 3 OUT1A, 2 OUT2B, 1 OUT2A

TP1 - VREF input to driver
Monitor this test point with meter
as you adjust current adj pot
Valid range 1.0V to Vcc
At VREF of 5V max current will be 833mA
At VREF of 3.3V max current will be 550mA
At VREF of 1V max current will be 166mA
Minimum current gives smoothest microsteps
Maximum current gives highest torque

VCC, TP1, R16, TRIMPOT5MM adj pot, R5 5.1K, GND
C4 680pF, R3 20K, GND

IC1 A3967SLB

1	REF	PFD	24
2	RC2	RC1	23
3	/SLEEP	/RESET	22
4	OUT2B	OUT1B	21
5	LOAD_SUPPLY2	LOAD_SUPPLY1	20
6	GND1	GND4	19
7	GND2	GND3	18
8	SENSE2	SENSE1	17
9	OUT2A	OUT1A	16
10	STEP	/ENABLE	15
11	DIR	LOGIC_SUPPLY	14
12	MS1	MS2	13

SLEEP: VCC, 10K R11
OUT2B
V+
R1 .75, GND
OUT2A
STEP
DIR
MS1: VCC, 10K R14

PFD intermediate voltage
Change R12 and add in
R17 to create any voltage
on PFD for best high
speed performance.
See datasheet

VCC, R12 10K, PFD
NOPOP ??? R17, GND
RESET: R15 10K, VCC
OUT1B: R4 20K, C5 680pF, GND
V+
OUT1A: R2 .75, GND
ENABLE: 10K R13, VCC, GND
MS2: R10 10K, VCC

Power Input
8V to 30V (Vcc = 5V)
6.3V to 30V (Vcc = 3.3V)

JP1, GND, C3 47uF, GND
C1 .1uF, GND
Both C3 and C1 must
Be rated for >=35V

V+
Must use LM317
For 30V V+ input

IC2 V_REG_317SMD (IN, OUT, ADJ)
R8 240

SJ1 Normally Shorted
Cut to use your own
Vcc source from JP4
SJ1

VCC, C2 1uf, GND
R9 1K, PWR LED YELLOW, GND

JP4
Vcc output
Max 70mA used by EasyDriver
The rest you can use

R6 390, SJ2, GND
R7 330, GND
SJ2 Normally Open -> Vcc=5.0V
SJ2 Closed -> Vcc = 3.3V

Change List:
v4.3 (12/09/2009)
  v4.3 Added mounting holes
v4.4 (10/24/2010)
  Fixed MIN/MAX silkscreen
  All vias now .02"
v4.4 (1/3/2012)
  C3 now at 47uF