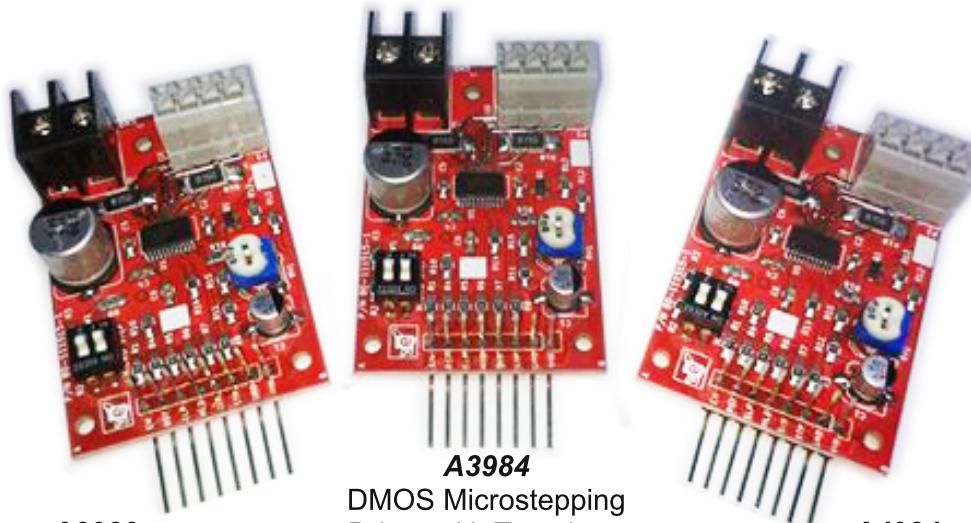


Microstep Driver

Technical Manual Rev 1r0



A3983
DMOS Microstepping
Driver with Translator

A3984
DMOS Microstepping
Driver with Translator

A4984
DMOS Microstepping
Driver with Translator
and Overcurrent Protection

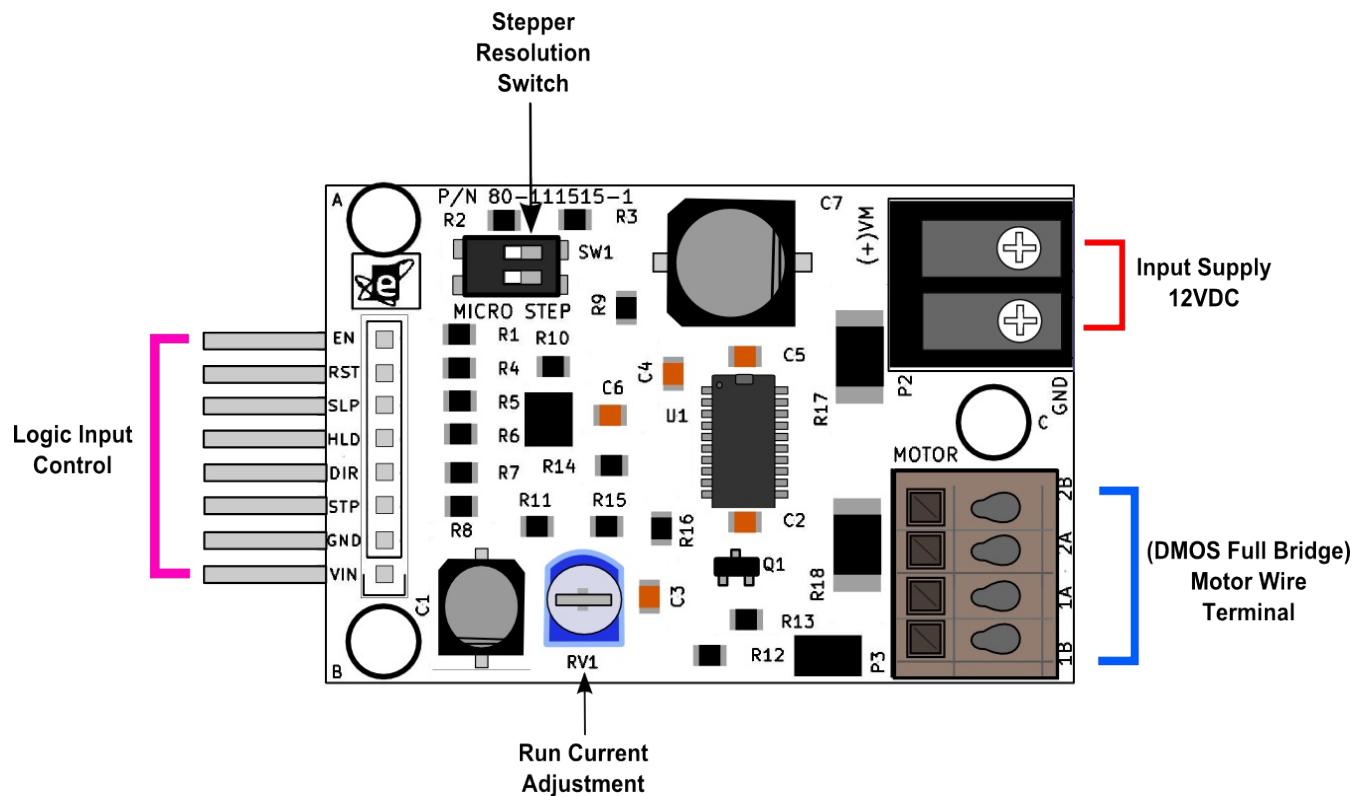
Microstep Driver is an ideal fit for applications where a complex microprocessor is unavailable or is overburdened. A complete microstepping motor driver with built-in translator for easy operation is based on 3 different variants of A3983, A3984 and A4984 IC. It is designed to operate bipolar stepper motors in full-half, quarter and eight-step modes with output drive capacity of up to 35V and 2A. IC includes a fixed off-time current regulator which has the ability to operate in Slow or Mixed decay modes. It simple to input one pulse on the STEP input drives the motor one microstep.

Features:

- Automatic current decay mode detection/selection.
- Mixed and Slow current decay modes
- Synchronous rectification for lower power dissipation.
- Internal UVLO
- Crossover-current protection.
- 3.3 and 5V compatible logic supply.
- Thermal shutdown circuitry.
- Short-to-ground protection.
- Shorted Load Protection.
- Low current Sleep mode,<10uA
- Compatible in all gizDuino boards.

General Specifications:

- Input Supply:** up to 12VDC
- Maximum Current:** 2A
- Packages:** 24-pin TSSOP with exposed thermal pad (LP Package)
- On-board IC:** A3983,A3984,A4984
- Motor Supply current:** <50 kHz (4mA), Operating(2mA),Sleep Mode(10uA)
- PCB Dimension:** 37mm x 56mm

**Figure 1.** Major parts presentation of Microstep Driver**Table 1:** P1 Connection

NAME	PIN DESCRIPTIONS
EN	Logic input
RST	Logic input
SLP	Logic input
HLD	Logic input
DIR	Logic input
STP	Logic input
GND	Ground
VIN	Logic Supply

Table 2: P2 Connection

NAME	PIN DESCRIPTIONS
+VM	Supply Voltage
GND	Ground

Table 3: P3 Connection

NAME	PIN DESCRIPTIONS
1A	DMOS full-bridge 1, Output A
1B	DMOS full-bridge 1, Outout B
2B	DMOS full-bridge 2, Output B
2A	DMOS full-bridge 2, Output A



Figure 2.
Thermal vias

Thermal vias are used to transfer heat to other layers of the PCB.

USAGE GUIDE

- 1:** Before you power the microstep driver, tilt it to one side. So that the air will flow at the back. (See Figure 2)
- 2:** The thermal pad should be soldered directly to an exposed surface on the PCB to transfer heat. The Bottom Layer of the PCB serves as heat sink, recommend to do this if you are using high current.

Typical Application Diagram

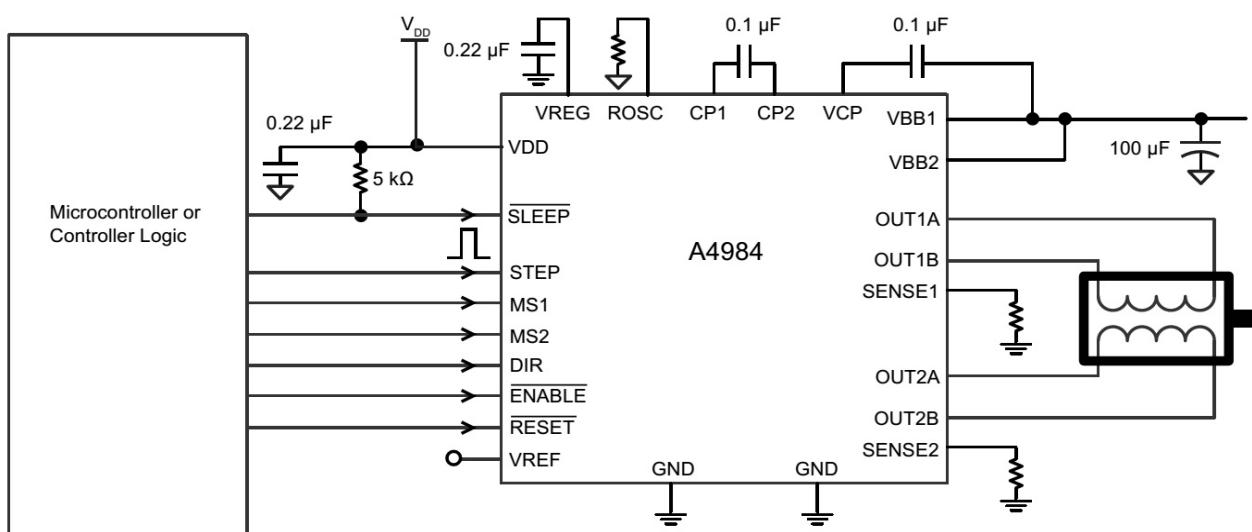
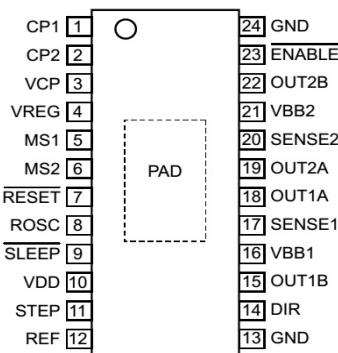


Figure 3. Typical Application

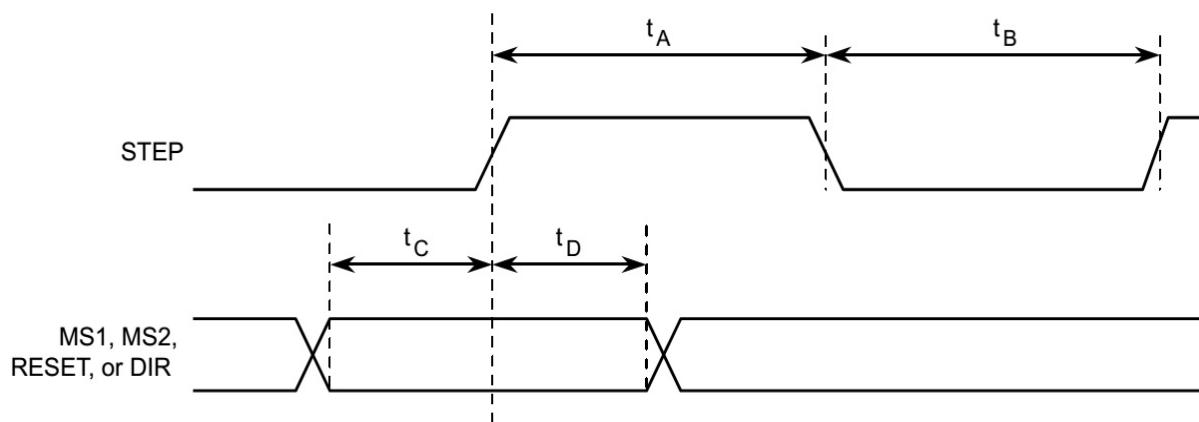
**Figure 4.** LP Package**Table 4.** Pin descriptions

NUMBER	NAME	DESCRIPTION
1	CP1	Charge pump capacitor terminal
2	CP2	Charge pump capacitor terminal
3	VCP	Reservoir capacitor terminal
4	VREG	Regulator decoupling terminal
5	MS1	Logic input
6	MS2	Logic input
7	RESET	Logic input
8	ROSC	Timing set
9	SLEEP	Logic input
10	VDD	Logic supply
11	STEP	Logic input
12	REF	Gm reference voltage input
13,24	GND	Ground
14	DIR	Logic input
15	OUT1B	DMOS Full Bridge 1 Output B
16	VBB1	Load supply
17	SENSE1	Sense resistor terminal for Bridge 1
18	OUT1A	DMOS Full Bridge 1 Output A
19	OUT2A	DMOS Full Bridge 2 Output A
20	SENSE2	Sense resistor terminal for Bridge 2
21	VBB2	Load supply
22	OUT2B	DMOS Full Bridge 2 Output B
23	ENABLE	Logic input
-	NC	No Connection
-	PAD	Exposed pad for enhanced thermal dissipation*

*The GND pins must be tied together externally by connecting to the PAD ground plane under the device.

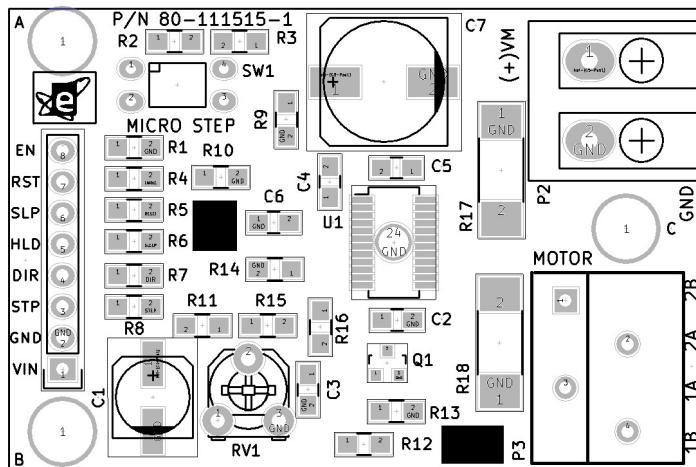
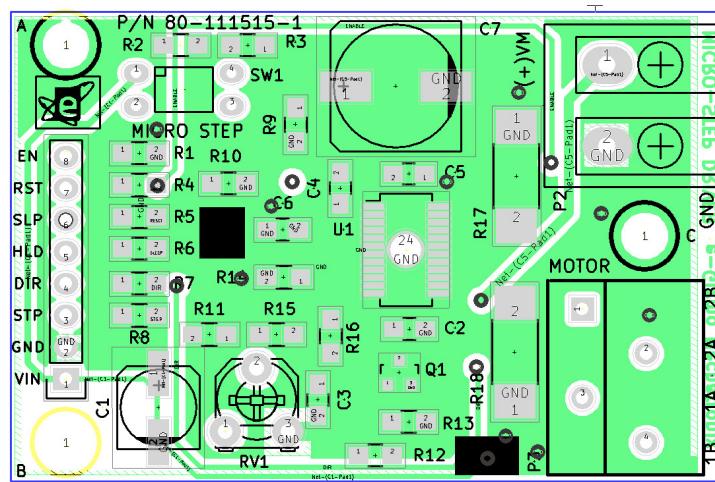
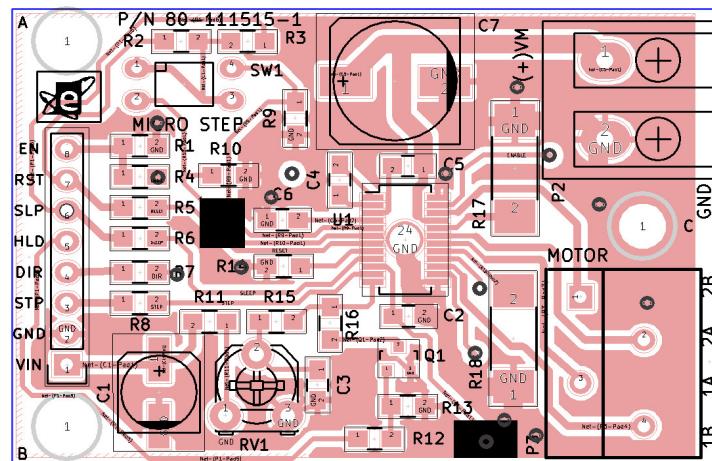
Table 5. Microstep Resolution

MS1	MS2	Microstep Resolution	Excitation Mode
L	L	Full Step	2 Phase
H	L	Half Step	1-2 Phase
L	H	Quarter Step	W1-2 Phase
H	H	Sixteenth Step	4W1-2 Phase



Time Duration	Symbol	Typ.	Unit
STEP minimum, HIGH pulse width	t_A	1	μs
STEP minimum, LOW pulse width	t_B	1	μs
Setup time, input change to STEP	t_C	200	ns
Hold time, input change to STEP	t_D	200	ns

Table 3. Logic Interface Timing

**Figure 5.** Silkscreen Guide**Figure 6.** Bottom Copper Guide**Figure 7.** Top Copper Guide

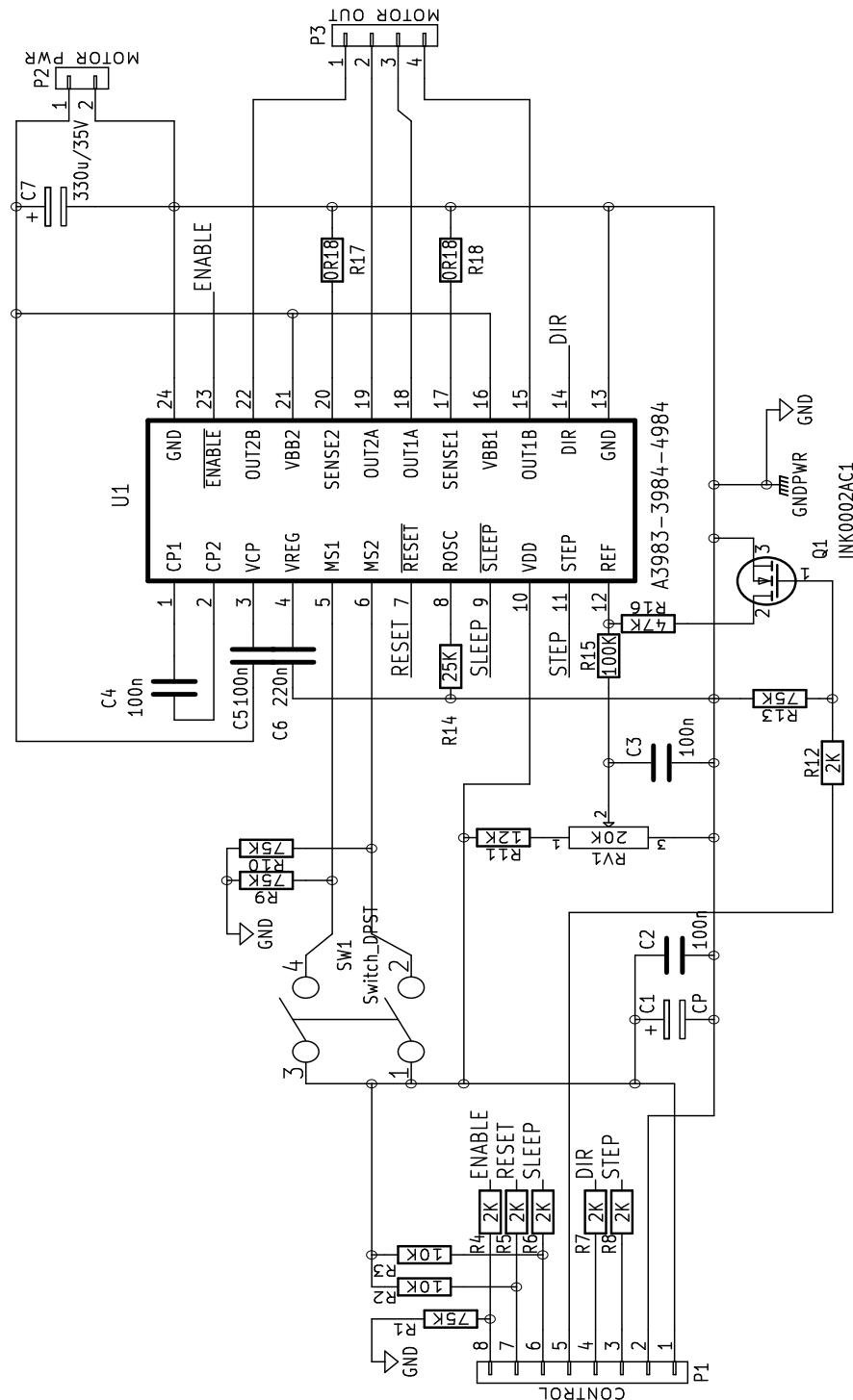


Figure 8. Schematic Diagram of e-Gizmo Microstep Driver

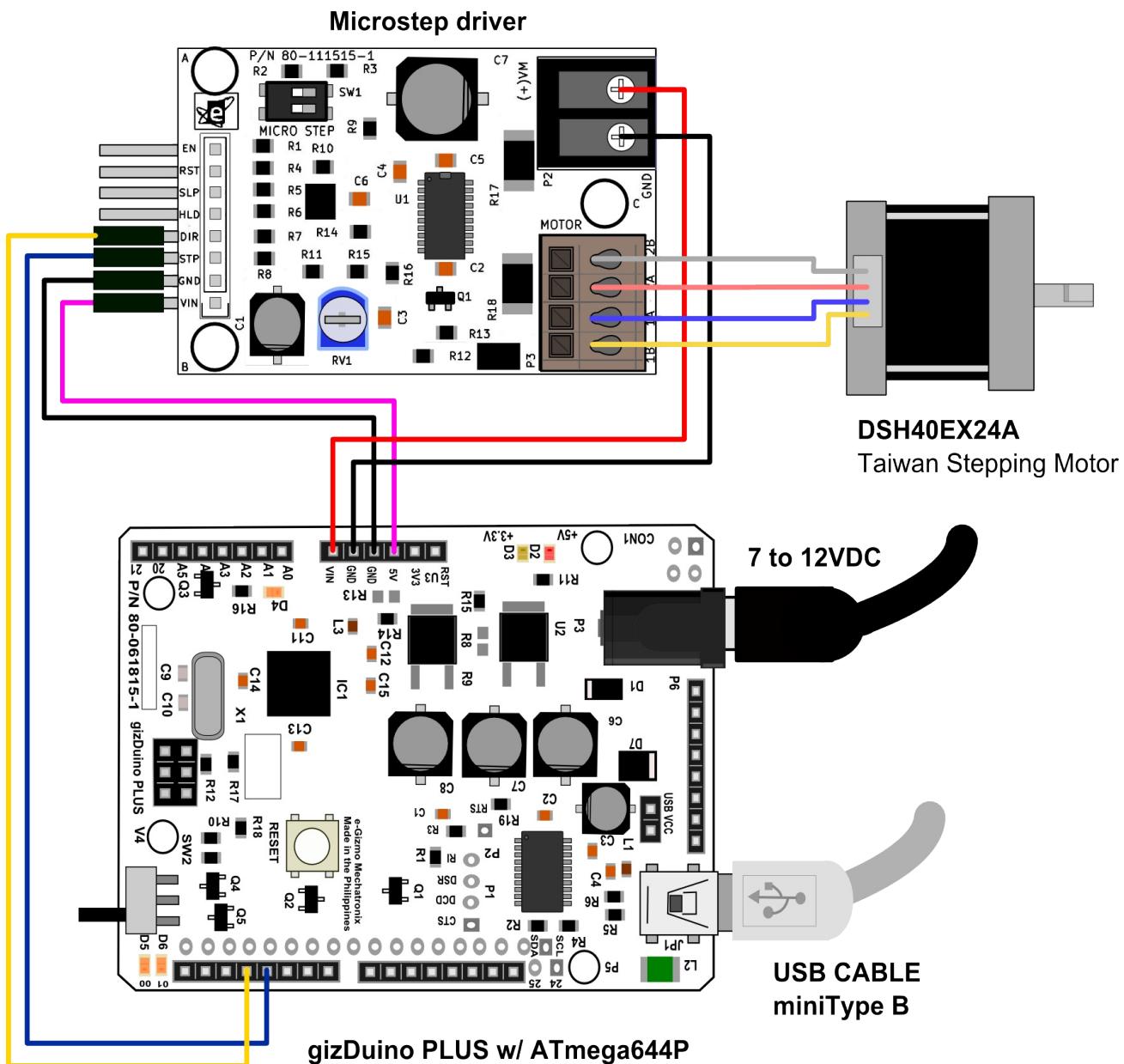


Figure 9. Sample Application of e-Gizmo Microstep Driver