

DMD556 Digital Microstepping Drive

Introduction

The high performance DMD556 digital microstepping drive results from the use of new, patented 32-bit DSP control technology. Each DMD drive calculates its own natural system frequency and applies a damping control algorithm for superior anti-resonance and drastically reduced motor noise by up to 70% of its original value, together with more benefits such as low speed ripple smoothing and low motor heating.



The DMD556 is the next generation of digital stepping motor controls. Its wider coverage in input voltage and output current ranges enable the DMD556 to drive more motors than the DMD422 digital stepper drive, owing to its higher performance DSP. The matched motors can achieve much higher speeds (above 3000RPM) than DMD422 does, offering servo-like performances.

Features

- Anti-Resonance, provides optimum torque and eliminates mid-range instability;
- Motor auto-tuning and parameter auto-configuration technology, offers optimum matching with different motors;
- Multi-Step allows a low resolution step input to produce a higher microstepping output for smooth system performance;
- Microstep resolutions programmable, from full-step to 102,400 steps/rev;
- Supply voltage up to +50 VDC;
- Output current programmable, from 0.5A to 5.6A
- Pulse input frequency up to 200 KHz;
- TTL compatible and optically isolated input;
- Automatic idle-current reduction;
- Suitable for 2-phase and 4-phase motors;
- Support PUL/DIR and CW/CCW modes;
- Over-voltage, over-current, phase-error protections

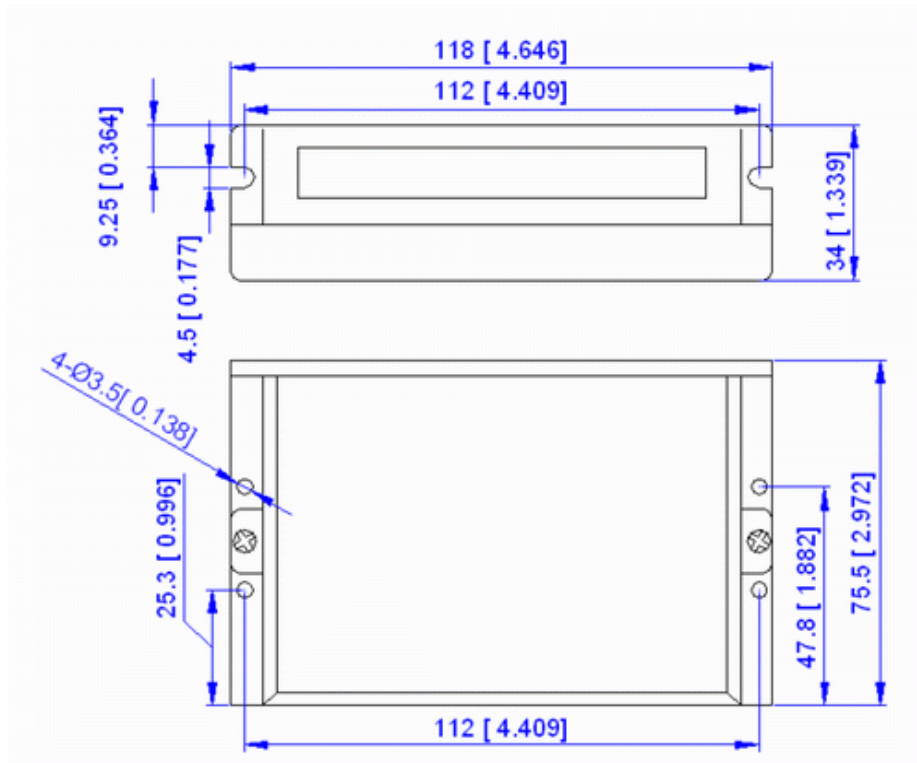
Applications

It can be used in various kinds of machines, such as laser cutters, laser markers, high precision X-Y tables, labeling machines and so on. Its unique features make the DMD556 an ideal solution for applications that require both low-speed smoothness and high speed performances.

Electrical Specification (Tj = 25°C/77°F)

Parameters	DMD556		
	Min.	Typical	Max.
Output current (A)	0.5	-	5.6 (4.0 RMS)
Supply voltage (VDC)	+20	-	+50
Logic signal current (mA)	7	10	16
Pulse input frequency kHz)	0	-	200
Isolation resistance (MΩ)	500		

Mechanical Specifications (in mm [inch], 1 inch = 25.4 mm)



Pin Assignment and Description

The DMD556 has two connectors, connector P1 for control signals connections, and connector P2 for power and motor connections. The following tables are brief descriptions of the two connectors. More detailed descriptions of the pins and related issues are presented in section 4, 5, 9.

Connector P1 Configurations

Pin Function	Details
PUL+	<p>Pulse signal: In single pulse (pulse/direction) mode, this input represents pulse signal, each rising or falling edge active (software configurable); 4-5V when PUL-HIGH, 0-0.5V when PUL-LOW. In double pulse mode (pulse/pulse), this input represents clockwise (CW) pulse, active both at high level and low level (software configurable). For reliable response, pulse width should be longer than 2.5µs. Series connect resistors for current-limiting when +12V or +24V used. The same as DIR and ENA signals.</p>
PUL-	
DIR+	<p>DIR signal: In single-pulse mode, this signal has low/high voltage levels, representing two directions of motor rotation; in double-pulse mode (software configurable), this signal is counter-clock (CCW) pulse, active both at high level and low level (software configurable). For reliable motion response, DIR signal should be ahead of PUL signal by 5µs at least. 4-5V when DIR-HIGH, 0-0.5V when DIR-LOW. Please note that rotation direction is also related to motor-drive wiring match. Exchanging the connection of two wires for a coil to the drive will reverse motion direction.</p>
DIR-	
ENA+	<p>Enable signal: This signal is used for enabling/disabling the drive. High level (NPN control signal, PNP and Differential control signals are on the contrary, namely Low level for enabling.) for enabling the drive and low level for disabling the drive. Usually left UNCONNECTED (ENABLED).</p>
ENA-	

Connector P2 Configurations

Pin Function	Details
+Vdc	Power supply, 20~50 VDC, including voltage fluctuation and EMF voltage
GND	Power Ground
A+, A-	Motor Phase A
B+, B-	Motor Phase B

Microstep Resolution Selection

When it's not in software configured mode, microstep resolution is set by SW5, 6, 7, 8 of the DIP switch as shown in the following table:

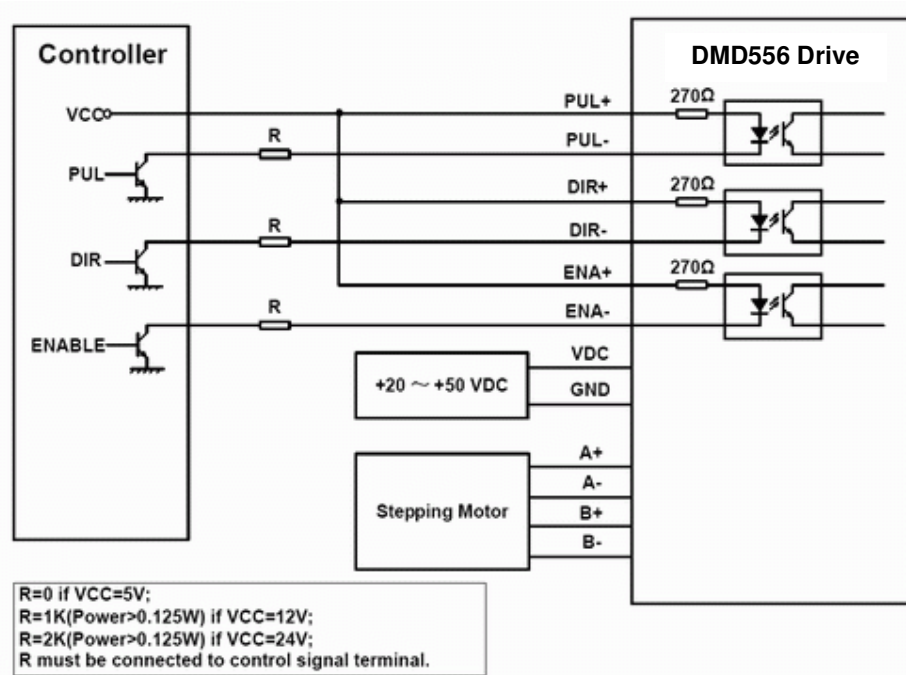
Microstep	Steps/rev. (for 1.8°motor)	SW5	SW6	SW7	SW8
1 to 512	Default / Software configured	ON	ON	ON	ON
2	400	OFF	ON	ON	ON
4	800	ON	OFF	ON	ON
8	1600	OFF	OFF	ON	ON
16	3200	ON	ON	OFF	ON
32	6400	OFF	ON	OFF	ON
64	12800	ON	OFF	OFF	ON
128	25600	OFF	OFF	OFF	ON
5	1000	ON	ON	ON	OFF
10	2000	OFF	ON	ON	OFF
20	4000	ON	OFF	ON	OFF
25	5000	OFF	OFF	ON	OFF
40	8000	ON	ON	OFF	OFF
50	10000	OFF	ON	OFF	OFF
100	20000	ON	OFF	OFF	OFF
125	25000	OFF	OFF	OFF	OFF

Current Setting

When it's not in software configured mode, the first three bits (SW1, 2, 3) of the DIP switch are used to set the dynamic current. Select a setting closest to your motor's required current.

Peak Current	RMS Current	SW1	SW2	SW3
Default/Software configured (0.1 to 5.6A)		OFF	OFF	OFF
2.1A	1.5A	ON	OFF	OFF
2.7A	1.9A	OFF	ON	OFF
3.2A	2.3A	ON	ON	OFF
3.8A	2.7A	OFF	OFF	ON
4.3A	3.1A	ON	OFF	ON
4.9A	3.5A	OFF	ON	ON
5.6A	4.0A	ON	ON	ON

Typical Connection



*** For full technical and installation details of DMD556 Digital Microstepping Drive, please refer to the *User's Manual for DMD556 Digital Microstepping Drive (Rev.1.0.)*