

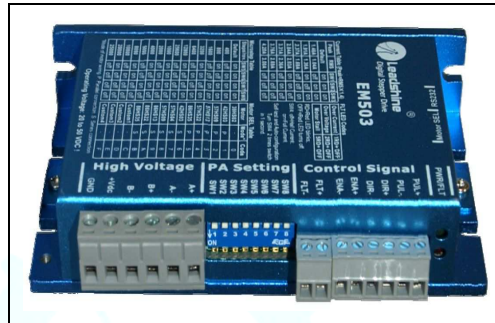
EM503

Stepper Motor Driver



Digital Driver Model EM503

Digital Technology, max. 50 VDC / 4.2 A (3.0 A RMS)



Product Description:

The EM503 is a versatile fully digital stepping driver based on a DSP with advanced control algorithm. The EM503 is the next generation of digital stepping motor controls. It brings a unique level of system smoothness, providing optimum torque and nulls mid-range instabilities. Motor self-test and parameter auto-setup technology offers optimum responses with different motors and makes it easy to use. The driven motors can run with much smaller noise, generate less heat, and move smoother than most other drivers on the market. Its unique features make the EM503 an ideal solution for applications that require low-speed smoothness.

The EM503 has a **"sensorless stall detection"** function to eliminate the costs of feedback device and cabling.

(*Note: The EM503 only detects motor stalls when running speeds >300 RPM.)

Features:

- **Sensorless stall detection**, eliminates costs of feedback device and cabling (>300 RPM)
- Anti-Resonance, provides optimum torque and nulls mid-range instabilities
- Supply voltage up to +50 VDC (recommended not to exceed 45 V because of "back EMF")
- Output current programmable, from 0.1 A to 4.2 A (Peak)
- Automatic idle-current reduction (in standstill mode) to reduce motor heating; function switchable (reduction rate can be software configured)
- Motor self-test and parameter auto-setup technology, offers optimum responses with different motors
- Pulse input frequency up to 200 kHz
- TTL compatible and optically isolated input
- Multi-Stepping allows a low resolution step input to produce a higher microstep output for smooth system performance
- Microstep resolutions programmable, from full-step to 102,400 steps/rev, setting via DIP switches or software
- Suitable for 2-phase and 4-phase motors
- Support PUL/DIR and CW/CCW modes
- Over-voltage, over-current, phase-error protections

Electrical Specifications:

Parameters	Min	Typ.	Max	Unit
Output current	0.21	-	4.2 (3.0 RMS)	A
Supply voltage	+20	+36	+50	VDC
Logic signal current	7	10	16	mA
Pulse input frequency	0	-	200	kHz
Insulation resistance	500			MΩ

Further Specifications:

Parameters	Min	Typ.	Max
Microsteps / 360°	200 (Full-step)		102.400
Pulse / Direction (PUL / DIR)		X	
Double pulse (CW / CCW)		X	
NEMA sizes	14		23
Motor type Mecheltron	35BYG-XXX		57BYGH-XXX

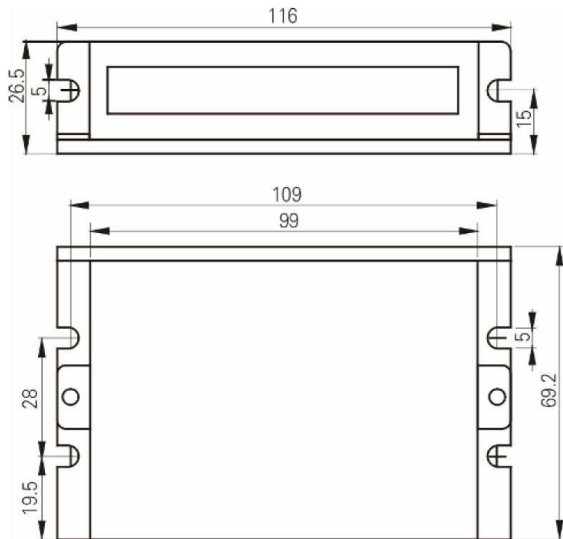
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Mechanical Specifications:



Unit: mm

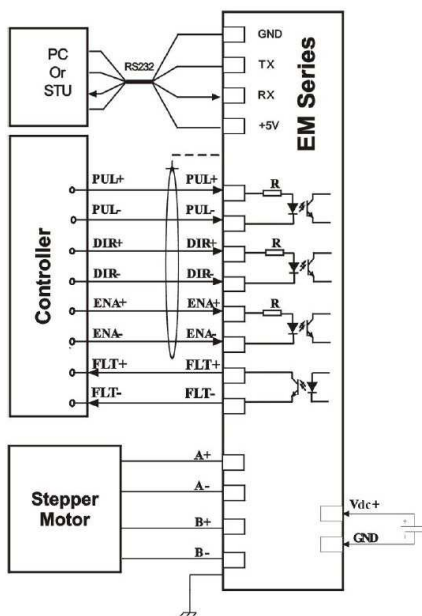
Applications:

Suitable for a wide range of stepper motors of NEMA sizes 14 to 23 (35 x 35 mm to 57 x 57 mm). It can be used in various kinds of machines, such as X-Y tables, engraving machines, labeling machines, laser cutters, pick-place devices, and so on. Particularly well suited for applications where low noise levels, less heat development, high speed and high precision are desired.

Typical Connection Schematic:

A typical system consists of stepper motor, stepper motor driver, power supply and controller. The following images show typical connection schematics:

Differential Control Signal



NPN Control Signal

