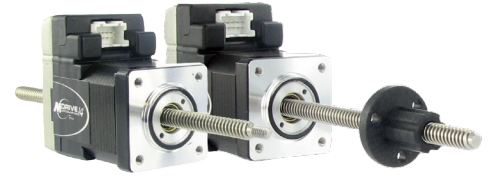


MDrive® Plus/Plus² MLI•14

NEMA 14 (35mm) Programmable Motion Control Linear Actuator with integrated 1.8° 2-phase stepper motor & control electronics

CE  REACH IP20



PRODUCT OVERVIEW

MDrive Linear Actuators are compact linear motion systems. External or non-captive shaft linear mechanicals are integrated with stepper motor and electronics for reliable, repeatable motion. Customization is available for volume opportunities.

Programmable Motion Control products integrate 1.8° 2-phase stepper motor linear actuator, fully programmable motion controller and drive electronics. An optional encoder can deliver stall detection, position maintenance and find index mark. Products include up to 8 I/O lines.

MDrive product's precision rolled lead screws are manufactured from premium grade stainless steel with optional Teflon® coating. Designed specifically for motion control applications, our high quality screws deliver long life and quiet operation.

Simplify machine design and reduce assembly time by replacing multiple components with a single compact integrated motor. Fewer individual system components eliminates multiple potential failure points, and lowers risk of electrical noise by eliminating cabling between motor and drive.

FEATURES AND BENEFITS

- Compact integrated microstepping drive, programmable motion controller and NEMA 14 1.8° 2-phase stepper motor
- Non-captive and external shaft style available
- Advanced current control for exceptional performance and smoothness
- Single supply: +12 to +48 VDC
- 20 microstep resolutions up to 51,200 steps per rev including: Degrees, Metric, Arc Minutes
- Auxiliary logic power supply input
- 0 to 5 MHz step clock rate selectable in 0.59 Hz increments
- IP20 protection rating
- Up to eight I/O lines and one 10-bit selectable analog input
- Programmable motor run/hold current
- Available options include:
 - Encoder
 - Multiple motor stack lengths
 - Long life linear actuators
 - Rear control knob for manual positioning
- Single motor stack length
- Lead screw lengths from 3.0" to 18.0" (77.5 to 455.0 mm) available in 0.1" (2.5mm) increments
- Lead screws with optional Teflon coating and threaded or smooth ends available
- Graphical user interface provided for quick and easy parameter setup



Additional setup, quick reference information, and supporting documents are available for download from the Novanta IMS download website <https://novantaims.com/downloads/>

Three-dimensional depictions of this product are available for download from <https://novantaims.com/dloads/3d-product-models/>



To select from the available features and build the LMD integrated stepper motor to fit your needs, use the Novanta IMS part number builder, available online at <https://novantaims.com/resources/part-number-builders/>

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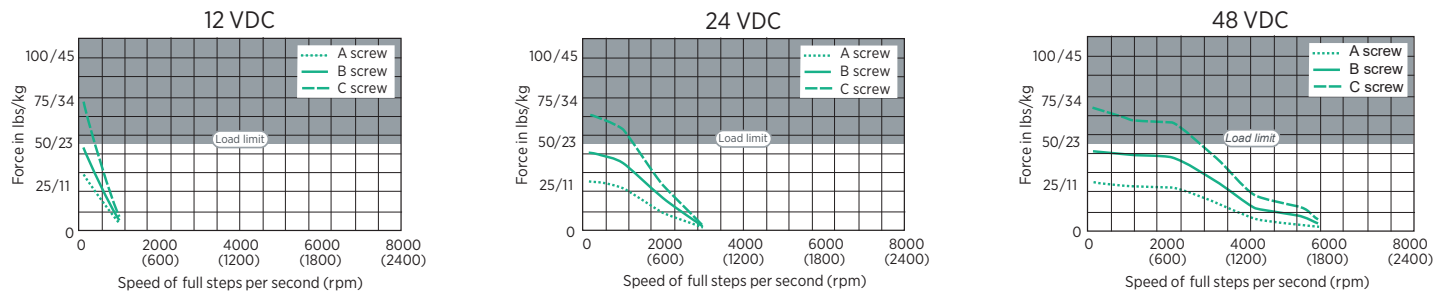
Motor Performance

		MDrive 14	
Motor		Stack length	Single
Holding torque		oz-in	18
		N-cm	13
Rotor inertia		oz-in-sec ²	0.0003
		kg-cm ²	0.021
Weight without screw		oz	8.0
		g	230.0
Maximum screw misalignment		"	±1
Maximum thrust ¹	Non-captive shaft	lbs	50
		kg	22
	External shaft with general purpose nut	lbs	25
		kg	11
	External shaft with anti-backlash nut	lbs	5
		kg	2
Maximum repeatability	General purpose	inch	0.005
		mm	0.127
	Anti-backlash ²	inch	0.0005
		mm	0.0127

¹ Performance data for maximum force/load is based on a static load and will vary with a dynamic load.

² Only applicable for External shaft linear actuator with anti-backlash nut.

Motor Speed Force



Test conditions: maximum force/load is based on a static load. This will vary with a dynamic load.

Load limits: non-captive shaft — 50lbs/22kg
external shaft — determined by selected nut

Screws¹

Screw lengths ²	minimum	inches	3.0	
		mm	77.5	
	maximum	inches	18.0	
		mm	455.0	
Load Limits ³	non-captive shaft	lbs	50	
		kg	22	
	external shaft w/ general purpose nut	lbs	25	
		kg	11	
	external shaft w/ anti-backlash nut	lbs	5	
		kg	2	
End Options	threaded	metric	M4 x 0.7 mm thread to within 0.03" / 0.76 mm of shoulder	
		UNC	#8-32 UNC-2A thread to within 0.03" / 0.76 mm of shoulder	
	smooth	inches	Ø 0.1967 ±0.001	
	none	mm	Ø 5 ±0.003	
Lead/Pitch	screw A	Travel	Per Rev	Per Full Step
		inches	0.250	0.00125
		mm	6.350	0.0317
		inches	0.125	0.00063
	screw B	mm	3.175	0.0158
		inches	0.063	0.00031
	screw C	mm	1.588	0.0079

¹ Stainless steel rolled screws are corrosion resistant and non-magnetic, with Teflon coating available.

² Standard 0.1" / 2.5mm screw length increments are available.

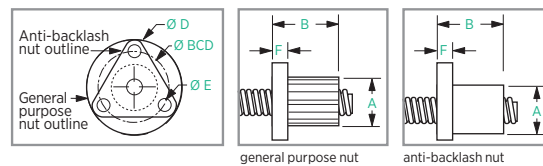
³ Performance data for maximum force/load is based on a static load and will vary with a dynamic load

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Nuts¹

			General Purpose Nuts	Anti-backlash Nuts
Dimensions	A	inches	0.50	0.50
		mm	12.7	12.7
	B	inches (max)	0.75	0.9
		mm (max)	19.1	22.86
	D	inches	1.0	1.0
		mm	25.4	25.4
	E	inches	0.14	0.14
		mm	3.6	3.6
F	inches	0.15	0.18	
	mm	3.81	4.57	
BCD	inches	0.75	0.75	
	mm	19.1	19.1	
Load limit		lbs	25	5
		kg	11	2
Drag torque			free wheeling	< 1.0 oz-in < 0.7 N-cm

¹ External shaft MDrive Linear Actuators employ a nut which moves axially along the threaded shaft as the screw rotates. Two nut styles are available: general purpose and anti-backlash. While anti-backlash nuts provide higher accuracy and low drag torque, general purpose nuts are rated for higher load limits.



Accessories

Description	Length feet (m)	Part Number
Communication Converter		
Electrically isolated, in-line converter pre-wired with mating connector to conveniently set/program communication parameters for a single MDrive Plus via a PC's USB port.		
Mates to 12-pin locking wire crimp connector	12.0 (3.6)	MD-CC403-001
Mates to 10-pin friction lock wire crimp connector 12.0 (3.6)	MD-CC402-001	12.0 (3.6)
Prototype Development Cables		
Speed test/development with pre-wired mating connector with other cable end open.		
Mates to 12-pin locking wire crimp connector for I/O, communication & power	10.0 (3.0)	PD12B-1434-FL3
Mates to 12-pin locking wire crimp connector for I/O, power and communication	10.0 (3.0)	PD10-1434-FL3
Mates to 16-pin locking wire crimp connector for I/O, power and remote encoder option	10.0 (3.0)	PD16-1417-FL3
Mating Connector Kit		
Connectors for the assembly of cables. (Cable material not included). Sold in lots of 5. Manufacturer's crimp tool recommended for crimp connectors		
12-pin locking wire crimp connector for I/O, power and communication	—	CK-08
10-pin friction lock wire crimp connector for communication	—	CK-02
16-pin locking wire crimp connector for I/O, power and remote encoder option	—	CK-10
Drive Protection Module		
Limits surge current and voltage to a safe level when DC input power to the MDrive Plus is switched on and off		
For all MLI•14 programmable motion control products	—	DPM75
Quick Start Kit		
For rapid design verification, all-inclusive QuickStart Kits includes prototype development cables and communication converter for MDrivePlus initial functional setup and system testing.		
For all MLI•14 programmable motion control products, add a "K" to the beginning of the part number when ordering		