

MDrive[®] Plus² MLI•14

CE  REACH IP20

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



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.

CANopen products integrate 1.8° 2-phase stepper motor linear actuator, motion controller and drive electronics, supporting CiA DS301 and DSP402 Device Profile for Drives and Motion Control. Options include encoder, and CANopen dongle MD-CC500-000 for product setup and testing.

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, motion controller and NEMA 14 1.8° 2-phase stepper motor
- Non-captive and external shaft style available
- Advanced current control with automatic current reduction 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
- IP20 protection rating
- Auxiliary logic power supply input
- 0 to 5 MHz step clock rate selectable in 0.59 Hz increments
- 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 threaded or smooth screw ends and Teflon coating available
- Graphical user interface provided for quick and easy configuration and programming via optional MD-CC500-000 comm converter



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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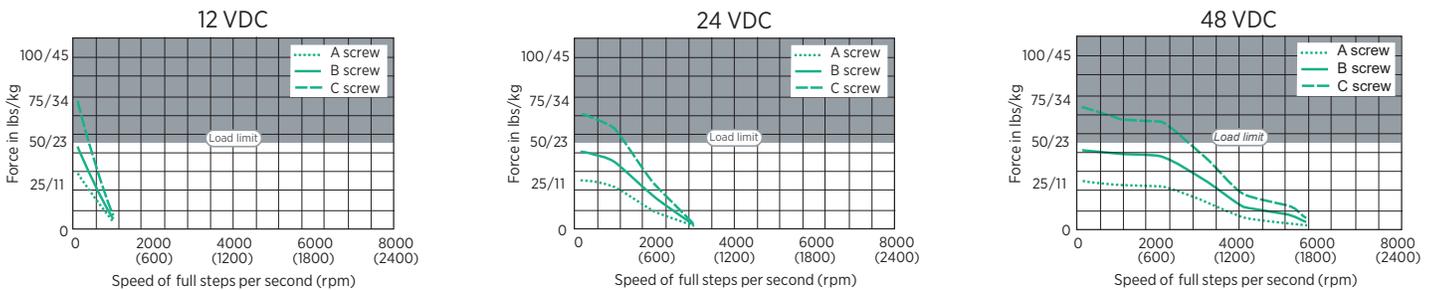
Motor Performance

			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 Torque



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	
		mm	Ø 5 ±0.003	
none	—	—		
Lead/Pitch	Travel	Per Rev		
		Per Full Step		
	screw A	inches	0.250	
		mm	6.350	
	screw B	inches	0.125	
		mm	3.175	
	screw C	inches	0.063	
		mm	1.588	

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.

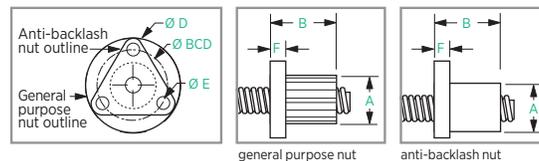
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Nuts¹

			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.		
Interface cable for all CANopen products. Requires mating connector adapter for DB9 connector. Requires power supply, not supplied.	12.0 (3.6)	MD-CC500-000
Prototype Development Cables Speed test/development with pre-wired mating connector with other cable end open.		
Mates to 16-pin locking wire crimp connector for I/O and power	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		
16-pin locking wire crimp connector for I/O and power	—	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 CANopen products	—	DPM75