

MDrive[®], motors, drives, and controls



Short Form Product Catalog

Simplifying machine building with intelligent motion systems.



Photo courtesy of Sener Diagnostics

Committed to your automation success

Reliable performance, innovative products — from the MDrive® family of all-in-one integrated motors to naked motors, controllers and drivers

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MDrive® INTEGRATED MOTORS FAMILY

Reducing machine complexity, size & cost for machine builders.

MDrive – a comprehensive family of integrated motors. Delivering reliable performance to a wide range of motion applications.

All-in-one integrated motors

MDrive products combine 1.8° 2-phase stepper motor, driver, controller, internal encoder and closed loop performance, all in one compact package. With fewer individual system components, you save space, reduce wiring, and eliminate multiple potential failure points.

Units are programmable and networkable, satisfying the motion control requirements of many new and existing applications. Products are built to order, with customization available. Quick turn shipping is offered for standard products.

The family of MDrive integrated motors includes:

Liberty MDrive

These robust products offer closed loop functionality to deliver enhanced performance and energy savings. Communication protocol choices include EtherNet/IP, Profinet, Modbus/TCP, CANopen, and serial RS-422/485 with programmable memory.

Liberty MDrive products consist of a robust rotary motor well suited for industrial applications, including an IP65 rated version with circular M12 connectors.

Liberty MDrive Linear products integrate mechanicals for linear motion with choice of external shaft linear actuator or electric cylinder.

See page 4 for details.

MDrive Plus

Applications with extremely limited space may find these ultra-compact products the best fit.

MDrive Plus are rotary motor products with a wide range of features and options. Match to your system requirements for a specialized motion solution at low cost.

MDrive Linear Actuators add mechanicals to MDrive Plus products to deliver linear motion with non-captive shaft or external shaft.

See page 5 for details.

40% Reduce system wiring up to 40% with integrated motors, while simplifying the EMC concept and improving machine reliability.

25% Cut installation time up to 25% when you replace multiple individual components with an MDrive integrated motor.

MDrive can simplify your motion control design challenges without requiring you be a mechatronic expert.

Integrated motors benefit many industries including:

- Medical
- Pharmaceutical
- Life sciences
- Lab automation
- Imaging
- Printing
- Packaging
- Material handling
- Labeling
- Electronics manufacture



LIBERTY MDRIVE®

For OEMs who want to reduce machine size, cost and complexity.

Robust Liberty MDrive products deliver exceptional performance and value to many stepper and servo motor applications. Especially well suited for industrial applications, including an IP65 rated version with M12 connectors for harsher environments. Closed loop hMT performance delivers many unique capabilities, including energy savings. A conditional 4-year warranty is standard for rotary motor products.

Liberty MDrive products are available with closed loop hMT performance. This can benefit your system, delivering enhanced features and performance including:

- closed loop feedback
- motors delivering up to 2X more torque
- variable current control for saving energy and reducing heat
- torque control



Liberty MDrive

Liberty MDrive (LMD) products high degree of integration can reduce machine complexity, size, and cost in many stepper and servo motor applications, both new and existing. A battery-free multi-turn absolute encoder can detect shaft movement and store position information for up to 30 days without power.

Supported network communication protocols include: EtherNet/IP (available in single and dual port), Profinet, Modbus/TCP, CANopen, and serial RS-422/485 with programmability. Automation libraries are also available to help expedite application development.

Rotary products combine 1.8° 2-phase stepper motor, controller, microstepping drive, and internal encoder with closed loop hMT performance.

Liberty MDrive Linears

All-in-one linear motion systems combine LMD integrated motor technology with linear mechanicals to deliver long life, high accuracy and repeatability.

Two linear styles are available: external shaft linear actuator and electric cylinder.

		LM • 42	LM • 57	LM • 85
Input voltage	VDC	+12...+48	+12...+60	+12...+70
Motor frame size	NEMA	17	23	34
	inch / mm	1.7 / 42	2.22 / 57	3.4 / 85
Liberty MDrive (rotary)				
Motor lengths	# stacks	1, 2 or 3	1, 2 or 3	1, 2 or 3
Holding torque range	oz-in	44...88	103...416	336...920
	N-cm	31...62	73...294	237...650
Connectors		Pluggable with locking keyed color-coded mates or M12 circular connector with IP65 rating		

Liberty MDrive Linears

External shaft linear actuator

		1	1	
Motor length	# stacks	1	1	
Screw lengths	inches	3.0...18.0	3.0...24.0	
	mm	76... 457	76... 610	
Screw diameter	inch / mm	0.25 / 6.35	0.375 / 9.525	na
Nut Load Limit				
— General Purpose nut	lbs / kg	25 / 11	60 / 27	
— Anti-backlash nut	lbs / kg	5 / 2	25 / 11	

Electric cylinder

		1	1	
Motor length	# stacks	1	1	
Stroke lengths	inches	2.0...18.0	2.0...24.0	
	mm	51... 457	51... 610	na
Screw diameter	inch / mm	0.25 / 6.35	0.375 / 9.525	
Nut dynamic load limit	lbs / kg	225 / 102	255 / 115	

MDrive® PLUS

Applications with extremely limited space may find these products the best fit.

MDrivePlus ultra compact rotary motor products have a wide range of features and options. Match these to your system requirements for the best rotary motion solution. Products are built to order, with quick turn shipping available.

MDrive Linear Actuators, built on the MDrivePlus integrated motor technology platform, include mechanicals for linear motion.



MDrive Plus

Rotary 1.8° 2-phase stepper motors with integrated electronics are low cost and extremely compact. Configure for your specific motion application needs by selecting from numerous options.

Control types range from CANopen to serial RS-422/485. With up to 8 I/O included, from +5 to +24 VDC, and programmable memory.

MDrive Plus Linear Actuators

All-in-one linear motion systems combine leading integrated motor technology with linear mechanicals to deliver long life, high accuracy and repeatability.

Two linear shaft styles are available: non-captive shaft and external shaft.

High quality, precision rolled lead screws are manufactured from premium grade stainless steel with optional Teflon® coating. Designed specifically for motion control applications to deliver long life and quiet operation.

		size 14	size 17	size 23	size 34	size 34AC ¹
Input voltage	VDC	+12...+48	+12...+48	+12...+75	+12...+75	-
	VAC	-	-	-	-	120 or 240
Motor frame size	NEMA	14	17	23	34	34
	inch / mm	1.4 / 36	1.7 / 42	2.22 / 57	3.4 / 85	3.4 / 85

MDrive Plus (rotary)

Motor lengths	# stacks	1 or 3	1, 2 or 3	1, 2, 3 or 4	1, 2 or 3	1, 2 or 3
Holding torque range	oz-inch	18...36	32...75	90...283	408...1090	330...750
	N-cm	13...25	23...53	64...200	288...770	233...529
Options		Encoder, control knob, industrial connectors with IP rating, interface cables, QuickStart Kit, Drive Protection Module, Ethernet Gateway				

MDrive Plus Linear Actuators

External and non-captive shafts

Motor lengths	# stacks	1	1	1	na	na
Screw length	inches	3.0...18.0	3.0...18.0	3.0...24.0		
	mm	76... 457	76... 457	76... 610		
Screw diameter	inch / mm	0.25 / 6.35	0.25 / 6.35	0.375 / 9.525		
Maximum thrust	lbs	50	50	200		

¹ Includes integrated power supply.

NAKED MOTORS, CONTROLLERS AND DRIVERS

Component level solutions for motion control applications including: rotary and linear stepper motors, controllers and discrete drivers.



Pictured above, left to right: assorted rotary stepper motors standard and custom, Liberty Motion Module, external shaft linear motors in a range of sizes, and MForce drives.

Rotary & linear stepper motors

Satisfy your system requirements with our extensive stepper motor offer. From meeting torque performance, size, shape and connector preferences, to mounting options, IP rating, shaft finishes and more. Need an encoder, interface cable, customization? We can also help with sizing a motor and drive package to provide a complete motion solution.

MForce drives

Compact MForce microstepping drives incorporate the same patented technology and programming as industry leading MDrivePlus products, just without the integrated stepper motor. MForce drives have up to 20 resolution settings from full to 256 microsteps per full step, extended operating temperature range, and advanced current control.

Product configurations:

- step/direction input with drive only
- programmable motion with drive and controller

Input voltage by version:

+12 to +75 VDC, MForce PowerDrive

+12 to +48 VDC, MForce MicroDrive

PowerDrive delivers enhanced performance and speed with maximum 5A RMS/7A peak per phase output current. While 3A RMS/4A peak of MicroDrive is big power from a small package 1.8x2.3x1.3" (45x59x33mm).

Liberty Motion Module (LMM)

Ultra-compact LMM is a PCB-mount programmable 1.5A motion controller and driver. Pair it with our 1- or 4-axis interface board and stepper motors for a ready to program motion system, or simply order a starter kit to make rapid prototyping even easier. Communication protocols and power range can also be customized.

PCB-mount discrete drivers

- IM481H - 1.5A microstep driver
- IM483H - 3.0A microstep driver
- IM805H - 5.0A microstep driver
- IB462He - 2.0A half/full step driver

For single- or multi-axis stepper motor applications, this family of ultraminiature PCB-mount discrete drivers deliver high performance at low cost. These compact drivers may reduce space used in your system without sacrificing features.

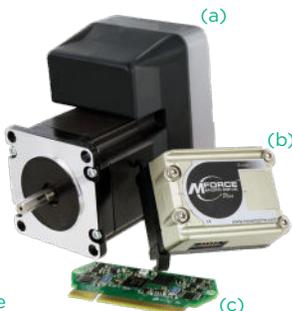
Complete specifications for all products are available on our website: novantaims.com

3-tier product offer: 1 programming platform

Work more efficiently and speed system programming with our intuitive MCode software platform.

MCode supports a three-tier product offer, allowing you to write, test and port programs to the product that best meets your size requirements, performance and cost targets.

- (a) Integrated solutions - MDrive products
- (b) Stand alone solutions - MForce drives
- (c) Board level solutions - Liberty Motion Module



CUSTOM PRODUCTS

When it comes to your form, fit, and function requirements, don't settle. Get precisely what you need.

Optimized motion solutions for OEMs

In addition to our standard products, we design customized solutions for OEMs. Our in-house team of experienced engineers has developed innovative system solutions in motion around the world.

When it comes to customizing products to meet your unique application needs, we know motion. To discuss your specific motion requirements, please reach us through one of the many contacts listed on our website: novantaims.com

Customization may include, but is not limited to:

- hardware modifications
- motor variations
- connector options
- accessories (e.g. gearbox, encoder, cabling)
- software/firmware locks and code creation
- PCB and chip level motion development
- specialty products/assemblies

Minimum volumes apply.



NETWORKING

For ease of implementation and consistent system interface, Novanta IMS supports the following standardized communication protocols:

EtherNet/IP, Profinet, Modbus/TCP

Ethernet products are ODVA tested and conformance compliant, with products operating as adapter class devices capable of explicit or implicit messaging.

CANopen

CANopen CiA DS301 and DSP402 protocols are supported, enabling products to operate as nodes on a common network. Consistent device profiles enable interoperability in new and existing systems.

RS-422/485

Products are available with RS-422/485 serial interface. These include programmability, along with on-board memory for storing programs.

Certifications and sustainability

Product compliance is independently validated to meet the most recent quality, environmental and performance standards. This includes adherence to conflict minerals and sustainability. In addition, our internal quality staff conducts rigorous ongoing testing and inspection to ensure conformance.



IP20/IP65

REACH

EtherNet/IP[™]
conformance tested



ISO 9001
ISO 14001

Automation libraries

Complimentary automation libraries are available for Liberty MDrive Ethernet TCP/IP products. Speed development and streamline coding with these tools for popular PACs & PLCs over Profinet and EtherNet/IP.

Add-on instructions designed to simplify the integration of the Liberty MDrive with popular models of PACs & PLCs are available from our website novantaims.com





Novanta

IMS

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Publication: IMS-BR-SFORM_A



This document has been
printed on recycled paper

January 2022

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