CE RoHS REACH

MDrive®Plus

MDM•34 Step/direction input

Product overview

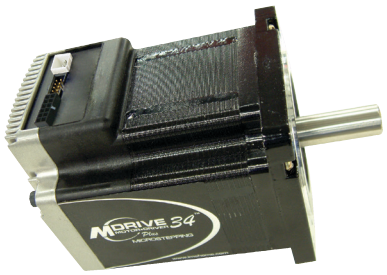
The MDrive® Plus with step/direction input is a 1.8° 2-phase stepper motor with on-board control electronics. Step/direction signals of a master controller, e.g. a motion controller, or A/B signals of an encoder are converted directly into motion.

Settings for MDrive Plus step/direction input products may be changed on-the-fly or downloaded and stored in nonvolatile memory using the SPI Motor Interface software provided. This eliminates the need for external switches or resistors. Parameters are changed via an SPI port.

Application areas

The MDrive Plus with step/direction input is ideal for machine builders who want an optimized motor with on-board electronics. The integrated electronics of these products reduces the potential for problems due to electrical noise by eliminating the cable between motor and drive. Fewer individual system components also eliminate multiple potential failure points.

Compact, powerful and cost effective, these motion control solutions deliver exceptional smoothness and performance that can reduce system cost, design and assembly time for a large range of 2-phase stepper motor applications.



MDM•34 MDrive Plus Step/direction input product: integrated NEMA34 motor and controls, IP20-rated

General features

Cost effective compact integrated microstepping drive and NEMA34 1.8° 2-phase stepper motor	
Advanced current control, with automatic current reduction, for exceptional performance and smoothness	
+12 to +75 VDC single supply	
20 microstep resolutions up to 51,200 steps per rev including: Degrees, Metric, Arc Minutes	
Optically isolated inputs	Universal +5 to +24 VDC signals, sourcing or sinking
Protection	IP20 rating
	Thermal temp warning, over voltage/current
Configurable	Motor run/hold current
	Motor direction via direction input
	Microstep resolution
	Clock type: step and direction, quadrature, step up and step down
	Programmable digital filtering for clock and direction inputs
Available options	Motor stack lengths
	Connector options
	Encoder
	Rear control knob for manual positioning
Setup parameters may be switched on-the-fly	
Graphical user interface provided for quick and easy parameter setup	

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MDrive Plus

MDM•34 Step/direction input

Specifications

Communication	Protocol type		SPI
Input power	Voltage	VDC	+12...+75
	Current maximum (1)	Amp	4.0
Motor	Frame size	NEMA	34
		inches	3.4
		mm	85
	Holding torque	oz-in	408...1090
		N-cm	288 ... 770
	Length	stack sizes	1, 2 & 3
Thermal	Operating temp non-condensing	Heat sink maximum	75°C
		Motor maximum	90°C
Protection	Type	Temp warning	Thermal, over voltage/current
		IP rating	IP20
Isolated input	Voltage range	Universal	+5 to +24 VDC sourcing or sinking step clock, direction and enable
Motion	Microstep resolution	Number of settings	20
		Steps per revolution	200, 400, 800, 1000, 1600, 2000, 3200, 5000, 6400, 10000, 12800, 20000, 25000, 25600, 40000, 50000, 51200, 36000 (0.01 deg/µstep), 21600 (1 arc minute/µstep), 25400 (0.001mm/µstep)
	Digital filter range		50 nS to 12.9 mS (10 MHz to 38.8 kHz)
	Clock types		Step/direction, quadrature, step up/step down
	Step frequency		2 MHz default / 5 MHz maximum
	Encoder	Internal optical style	Single-end or differential, with index mark

(1) Actual power supply current will depend on voltage and load.

Setup parameters (2)

SPI communication	Command	Function	Range	Units	Default
	MHC	Motor hold current	0 to 100	percent	5
	MRC	Motor run current	1 to 100	percent	25
	MSEL	Microstep resolution	1, 2, 4, 5, 8, 10, 16, 25, 32, 50, 64, 100, 108, 125, 127, 128, 180, 200, 250, 256	mSteps per full step	256
	DIR	Motor direction override	0 / 1	—	CW
	HCDT	Hold current delay time	0 or 2 – 65535	mSec	500
	CLK TYPE	Clock type	Step/Dir, Quadrature, Up/Down, CW/CCW	—	Step/Dir
	CLK IOF	Clock and direction filter	50 nS to 12.9 mS (10 MHz to 38.8 kHz)	nS (MHz)	200 nS (2 MHz)
	USER ID	User ID	Customizable	1-3 characters	IMS
	EN ACT	Enable active	High/Low	—	High
	WARN TEMP	Over temperature warning	0 to 125° C	°C	80° C

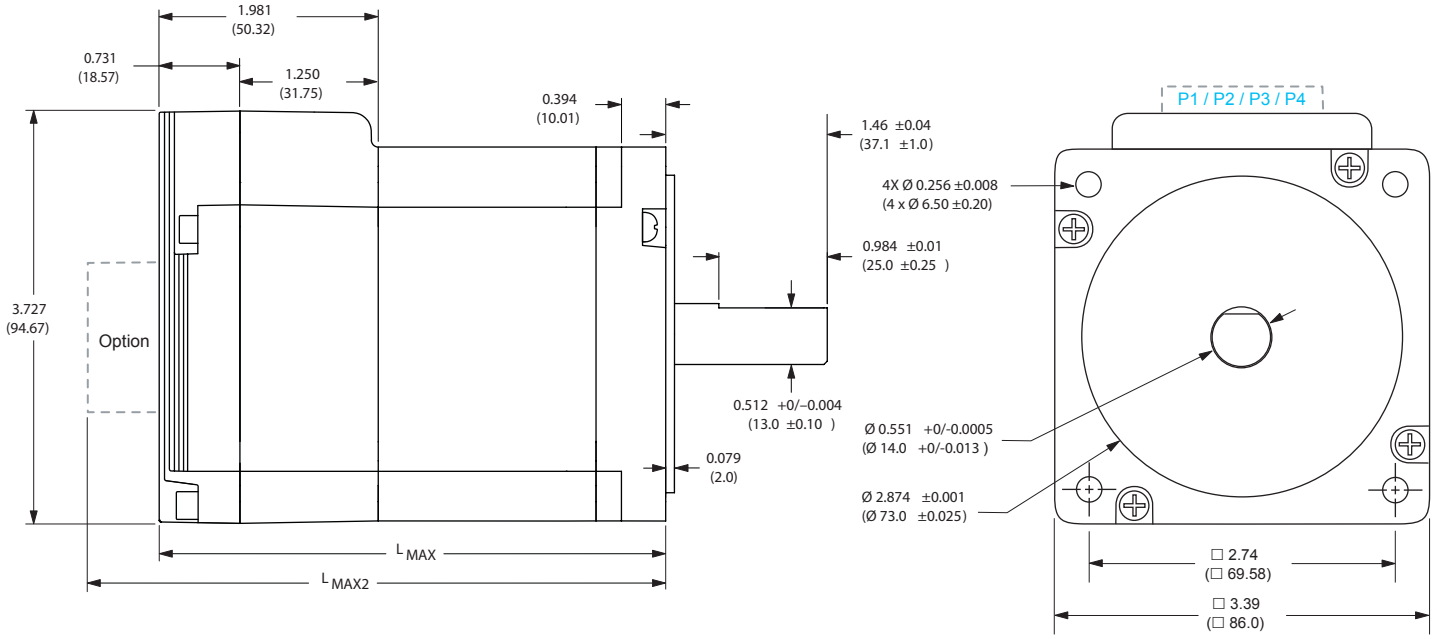
(2) All parameters are set using the supplied SPI Motor Interface GUI and may be changed on-the-fly.
An optional Communication Converter is recommended with first orders.

See User Manual for complete details: https://novantaims.com/dloads/product-literature/manuals-3/

Dimensions

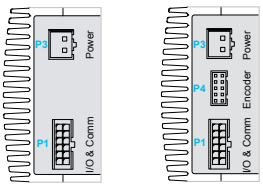
MDM•34 NEMA34 motor, IP20-rated

inches (mm)

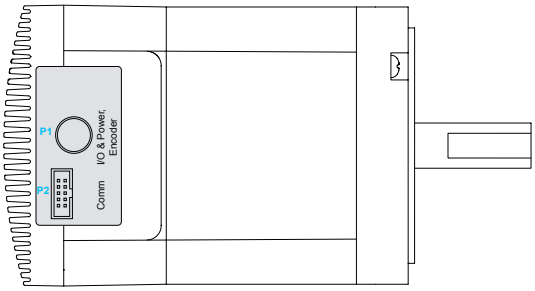


Motor stack length	Lmax	Lmax2
Single	3.81 (96.77)	4.52 (114.81)
Double	4.60 (116.84)	5.31 (134.87)
Triple	6.17 (156.72)	6.88 (174.75)

Connector options

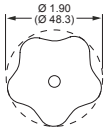


Pluggable interface version:
12-pin and 2-pin locking wire crimp connectors only, or with 10-pin friction lock wire crimp connector when optional internal encoder is included



Flying leads interface version:
12" (305mm) flying leads with 10-pin non-locking IDC connector

Lmax2 option



control knob

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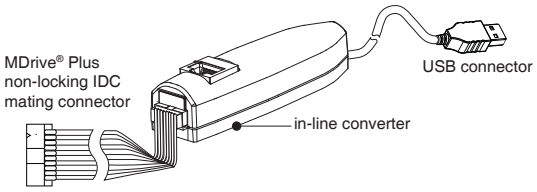
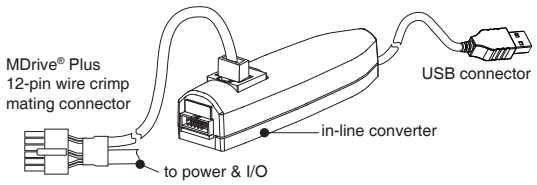
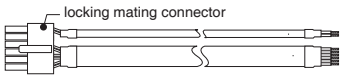


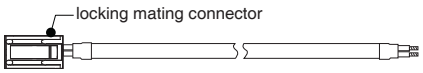
MD-CC300-001



MD-CC303-001



PD12-1434-FL3



PD02-3400-FL3

Accessories

description	length feet (m)	part number
QuickStart Kit For rapid design verification, all-inclusive QuickStart Kits includes prototype development cables and a communication converter for MDrive Plus initial functional setup and system testing.		
For all MDrive34 step/direction input products	—	add "K" to 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 10-pin non-locking IDC connector	12.0 (3.6)	MD-CC300-001
Mates to 12-pin locking wire crimp connector	12.0 (3.6)	MD-CC303-001
Prototype development cable Speed test/development with pre-wired mating connector with other cable end open.		
Mates to 12-pin locking wire crimp connector for I/O and communication	10.0 (3.0)	PD12-1434-FL3
Mates to 2-pin locking wire crimp connector for power	10.0 (3.0)	PD02-3400-FL3
Encoder cable Pre-wired mating connector with other cable end open.		
Mates to 10-pin friction lock wire crimp connector for optional internal differential optical encoder	6.0 (1.8)	PD10-3400-FL3
Mating connector kits Connectors for assembly of cables, cable material not supplied. Sold in lots of 5. Manufacturer's crimp tool recommended for crimp connectors.		
12-pin locking wire crimp connector for I/O & communication	—	CK-03
2-pin locking wire crimp connector for power	—	CK-05
10-pin friction lock wire crimp connector for optional internal differential optical encoder	—	CK-02
10-pin non-locking IDC connector for communication	—	CK-01
Drive protection module Limits surge current and voltage to a safe level when DC input power is switched on-and-off to an MDrive Plus.		
For all MDrive34 step/direction input products	—	DPM75

MDrive Plus

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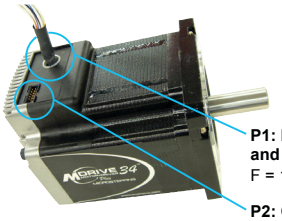
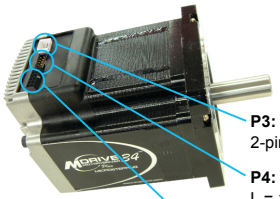
MDrive® 34 Plus
flying leads interface



P1: I/O & Power, and optional encoder
F = 12" flying leads

P2: Communication
D = SPI with 10-pin IDC non-locking connector

MDrive® 34 Plus
pluggable interface



P3: Power
2-pin locking wire crimp

P4: Optional Encoder
L = 10-pin friction lock wire crimp connector
Z = None. No encoder.

P1: I/O & Communication
C = SPI with 12-pin locking wire crimp connector

Part numbers

IP20-rated products

example part number	K	M	D	M	1	F	S	D	3	4	A	7	–N
QuickStart Kit K = kit option, omit from part number if unwanted	K	M	D	M	1	F	S	D	3	4	A	7	–N
MDrivePlus version MDM = Step/direction input	K	M	D	M	1	F	S	D	3	4	A	7	–N
Input 1 = Plus version with universal input	K	M	D	M	1	F	S	D	3	4	A	7	–N
P1 connector F = flying leads C = wire crimp (1)	K	M	D	M	1	F	S	D	3	4	A	7	–N
Communication type S = SPI	K	M	D	M	1	F	S	D	3	4	A	7	–N
P2 connector D = IDC with P1 connector F P4 connector L = wire crimp with P1 connector C and differential encoder Z = none with P1 connector C and no encoder	K	M	D	M	1	F	S	D	3	4	A	7	–N
Motor size 34 = NEMA 34 3.4" / 85mm	K	M	D	M	1	F	S	D	3	4	A	7	–N
Motor length A = single stack B = double stack C = triple stack	K	M	D	M	1	F	S	D	3	4	A	7	–N
Drive voltage 7 = +12 to +75 VDC	K	M	D	M	1	F	S	D	3	4	A	7	–N
Options — omit from part number if unwanted –N = rear control knob for manual positioning –E__ = internal optical encoder w/ index mark													–N

line count	100	200	250	256	400	500	512	1000	1024
single-end part #	E1	E2	E3	EP	E4	E5	EQ	E6	ER
differential part #	EA	EB	EC	EW	ED	EH	EX	EJ	EY

(1) Only available with differential encoder.

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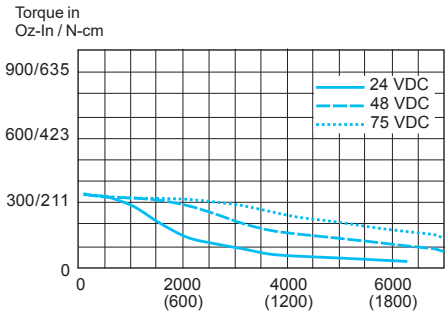
Motor performance

MD•34 NEMA 34 motor specifications	Motor	Stack length	Single	Double	Triple
	Holding torque	oz-in	408	574	1090
		N-cm	288	405	770
	Detent torque	oz-in	10.9	14.16	19.83
		N-cm	7.7	10.0	14.0
	Rotor inertia	oz-in-sec^2	0.01275	0.01924	0.03849
		kg-cm^2	0.90	1.35	2.70
	Weight (motor+driver)	lb	4.1	5.5	8.8
		kg	1.9	2.5	4.0

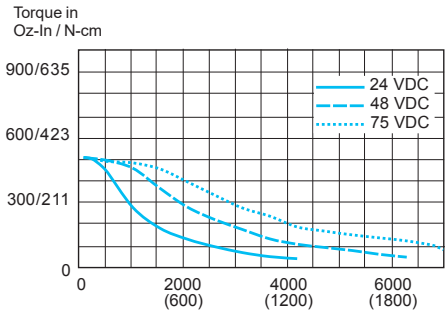
MD•34 NEMA 34 speed torque (1)

Single stack length



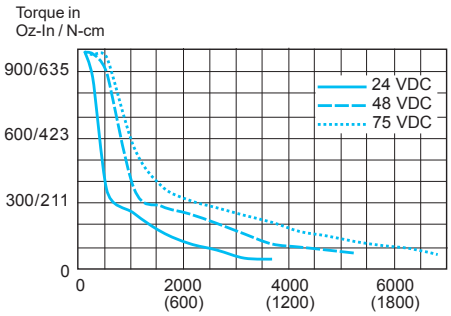
Speed of rotation in full steps per second (rpm)

Double stack length



Speed of rotation in full steps per second (rpm)

Triple stack length



Speed of rotation in full steps per second (rpm)

(1) Test conditions: 100% current with damper simulating load.

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