

MDrive[®] Plus

MDI•34 CANopen

Product overview

MDrive[®] Plus CANopen products integrate 1.8° 2-phase stepper motor, motion controller, drive electronics and optional encoder. Products support CiA DS301 and DSP402 Device Profile for Drives and Motion Control.

Firmware is provided for setup and testing MDrivePlus CANopen products. CANopen Tester software and communication dongle (MD-CC500-000) are also available.

Application areas

MDrivePlus products deliver reliable performance for new and existing motion control applications. Satisfying the requirements for a wide range of machine builders.

Simplify your machine design and reduce cabinet size 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.

These compact, powerful and cost effective 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.



MDrivePlus MDI•34 CANopen products: integrated NEMA34 motor and controls, IP20-rated

General features

Compact integrated microstepping drive, motion controller and NEMA34 1.8° 2-phase stepper motor

Advanced current control for exceptional performance and smoothness

+12 up to +75 VDC single supply

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

Up to 8 I/O lines

One 10 bit selectable analog input

Communication CANopen

Protection IP20 rating

Thermal temp warning, over voltage/current

Programmable Motor run/hold current

Available options Motor stack lengths

Encoders

Rear control knob for manual positioning

Graphical user interface provided for quick and easy parameter setup

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Specifications

Communication	Type	CANopen CiA DS301 (V3.0), DSP402 (V2.0), 2.0B active		
	Baud rate	Configurable 5 KB to 1 Mb		
	ID	11 and/or 29 bit		
	Isolation	Galvanic		
	Features	Node guarding, heartbeat, SDOs, PDOs (variable mapping)		
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	IP rating	IP20	
		Temp warning	Thermal, over voltage/current	
		I/O warnings	Over temp, short circuit, transient, over voltage, inductive clamp	
Auxiliary logic input	Voltage range	+12 to +24 VDC When input voltage is removed, maintains power only to control and feedback circuits.		
Analog input	Resolution	10 bit		
	Voltage range	0 to +5 VDC, 0 to +10 VDC, 0-20 mA, 4-20 mA		
General purpose I/O	Output sinking current	Up to 600 mA		
	Number	8 or 4 (2)		
	Type	Sourcing or sinking outputs/inputs		
	Logic range	Sourcing outputs +12 to +24 VDC, inputs and sinking outputs tolerant to +24 VDC, inputs TTL level compatible		
Motion	Open loop configuration	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)	
	Counters	Type	Position, encoder / 32 bit	
		Edge rate maximum	5 MHz	
	Velocity	Range	+/- 5,000,000 steps per second	
		Resolution	0.5961 steps per second	
	Accel/Decel	Range	1.5 to 10 ⁹ steps per second ²	
		Resolution	90.9 steps per second ²	
	Electronic gearing external clock in (3)	Range	0.001 to 2.000	
		Resolution	32 bit	
		Threshold	TTL	
	High speed I/O	Position capture	Input filter range 50 nS to 12.9 μS (10 MHz to 38.8 kHz)	
			Resolution 32 bit	
		Trip output	Speed 150 nS	
			Resolution 32 bit	
		Threshold TTL		
	Position feedback	Optional	Remote encoder interface required	
Software	Setup parameters	Storable to nonvolatile memory		
	Transmit PDOs	3 dynamically mappable		
	Receive PDOs	3 dynamically mappable		
	Manufacturer specific objects	I/O configuration, run/hold current		
	Modes of operation	Profile position, homing mode, profile velocity		
	Input functions	General purpose, homing mode profiles		
	Output functions	General purpose		

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

(2) I/O is reduced from 8 to 4 for products with remote encoder option.

(3) Adjusting the microstep resolution can increase the range.

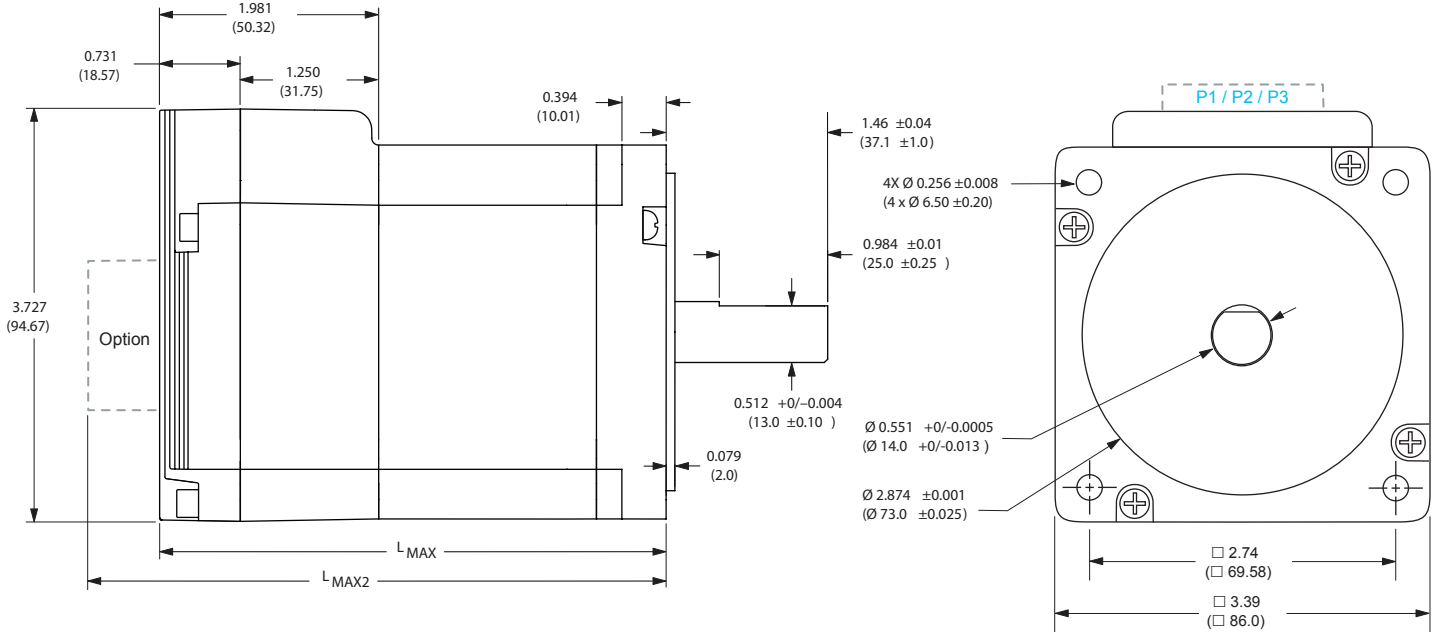
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Dimensions

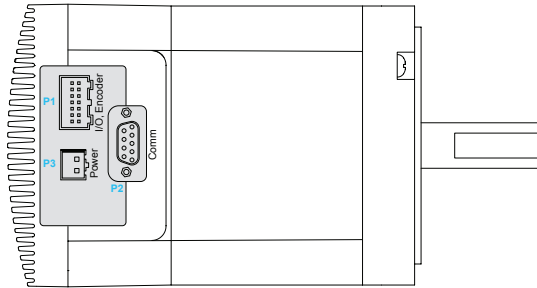
MDI•34 CANopen NEMA34 motor, IP20-rated

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



Lmax2 option



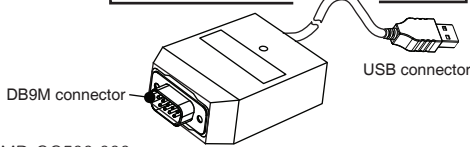
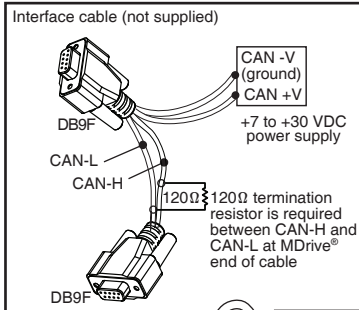
Pluggable interface version:
14-pin* and 2-pin locking wire crimp and DB9 male connectors

* 14-pin replaced by 20-pin locking wire crimp connector when optional remote encoder is included

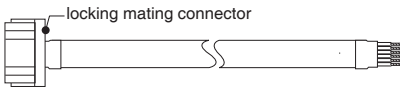
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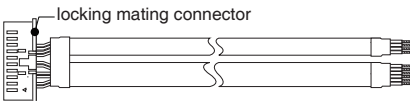
Accessories



MD-CC500-000



PD14-2334-FL3



PD20-3400-FL3



PD02-3400-FL3

description	length feet (m)	part number
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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
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Prototype development cable

Speed test/development with pre-wired mating connector with other cable end open.

Mates to 14-pin locking wire crimp connector for I/O and internal encoder option	10.0 (3.0)	PD14-2334-FL3
Mates to 20-pin locking wire crimp connector for I/O and remote encoder option	10.0 (3.0)	PD20-3400-FL3
Mates to 2-pin locking wire crimp connector for power	10.0 (3.0)	PD02-3400-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.

14-pin locking wire crimp connector for I/O and internal encoder option	—	CK-09
20-pin locking wire crimp connector for I/O and remote encoder option	—	CK-11
2-pin locking wire crimp connector for power	—	CK-05

Drive protection module

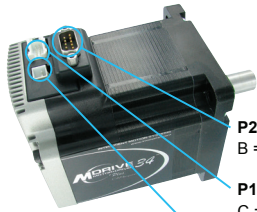
Limits surge current and voltage to a safe level when DC input power is switched on-and-off to an MDrive Plus.

For all MDrive34 CANopen products	—	DPM75
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MDrive® 34 Plus² IP20 pluggable interface



P2: Communication

B = CANopen with DB9 male connector

P1: I/O, and optional remote encoder

C = 14-pin locking wire crimp connector (20-pin with remote encoder option)

P3: Power

2-pin locking wire crimp connector

Part numbers

IP20-rated products

example part number	M	D	I	3	C	C	B	3	4	A	7	-N
MDrivePlus version MDI = Intelligent — CANopen	M	D	I	3	C	C	B	3	4	A	7	-N
Input 3 = Plus ² version with expanded features	M	D	I	3	C	C	B	3	4	A	7	-N
P1 connector C = wire crimp	M	D	I	3	C	C	B	3	4	A	7	-N
Communication type C = CANopen	M	D	I	3	C	C	B	3	4	A	7	-N
P2 connector B = DB9	M	D	I	3	C	C	B	3	4	A	7	-N
Motor size 34 = NEMA 34 3.4" / 85mm	M	D	I	3	C	C	B	3	4	A	7	-N
Motor length A = single stack B = double stack C = triple stack	M	D	I	3	C	C	B	3	4	A	7	-N
Drive voltage 7 = +12 to +75 VDC	M	D	I	3	C	C	B	3	4	A	7	-N
Options — omit from part number if unwanted												-N
-N = rear control knob for manual positioning												
-EQ = internal 512-line optical encoder w/ index mark												
-EE = remote differential encoder interface; encoder not supplied												

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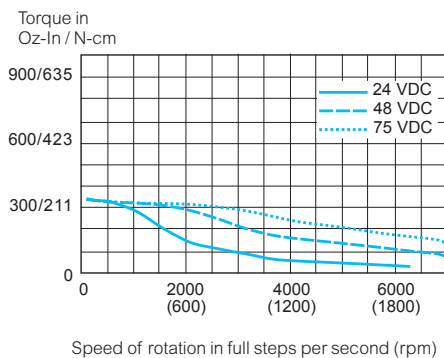
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Motor performance

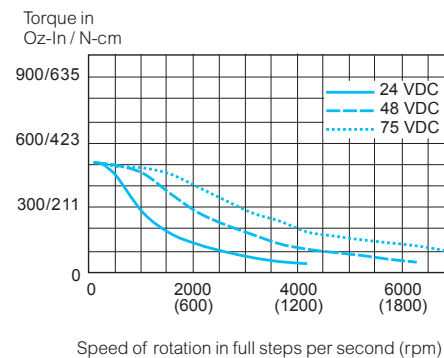
MD•34 NEMA 34 motor specifications	Motor	Stack length	Single	Double	Triple
			Holding torque	oz-in	408
		N-cm	288	405	770
Detent torque	oz-in		10.9	14.16	19.83
	N-cm		7.7	10.0	14.0
Rotor inertia	oz-in-sec ²		0.01275	0.01924	0.03849
	kg-cm ²		0.90	1.35	2.70
Weight (motor+driver)	lb		4.1	5.5	8.8
	kg		1.9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

MD•34 NEMA 34 speed torque (1)

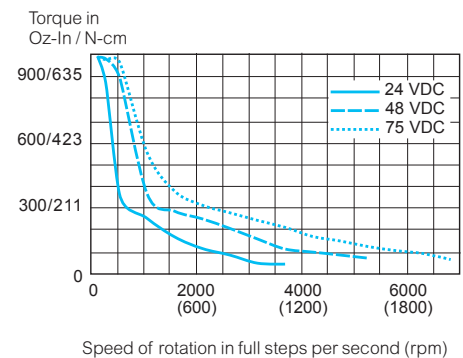
Single stack length



Double stack length



Triple stack length



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