

Lexium MDrive®

LMD•E57 Ethernet TCP/IP

Product overview

Robust Lexium MDrive® Ethernet TCP/IP products integrate 1.8° 2-phase stepper motors with control electronics including an Ethernet controller that supports user-selectable protocols: Profinet, EtherNet/IP, and ModbusTCP. An optional encoder delivers hMT closed loop performance.

Lexium MDrive products are ODVA-compliant adapter class devices capable of explicit or implicit messaging. Compact motion control solutions that interface with many manufacturer's systems.

Products with encoder feature hMT closed loop performance to maintain functional motor control and prevent loss of synchronization. Benefits include: variable current control, torque control, using the motor's full torque range without derating.

Application areas

Especially well suited for industrial applications, products include an IP65 rated version with circular

M12 connectors. A high torque motor (LMH•57) is also available, increasing torque up to 50%.

Lexium MDrive products can reduce machine complexity, size and cost in many stepper and servo motor applications. Their high degree of integration can increase system reliability by reducing the number of individual components, eliminating multiple potential failure points.



LMD•E57 Lexium MDrive Ethernet TCP/IP products: integrated NEMA23 motor and controls, IP65 & IP20-rated

General features

Robust control electronics, including Ethernet controller, integrated with NEMA23 1.8° 2-phase stepper motor	
Advanced current control for exceptional performance and smoothness	
Ethernet TCP/IP with 100 Mbps baud rate	
+12 to +60 VDC single supply	
20 microstep resolutions up to 51,200 steps per rev including: Degrees, Metric, Arc Minutes	
62 software addresses for multi-drop communications	
Protection	0...84°C temperature warning, user selectable IP20, IP65 ratings
Communication protocols	EtherNet/IP Profinet ModbusTCP MCode/TCP
Encoder	1000 lines / 4000 edges per rev internal magnetic
336 user program labels / 11,120 bytes flash memory	
0 to 2.56 MHz step clock rate selectable in 0.59 Hz increments	
Graphical user interface provided for quick and easy parameter setup	
4 year warranty	

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Specifications

Communication	Type	Ethernet TCP/IP		
	Protocols	Profinet		
		EtherNet/IP (ODVA compliant)		
		Modbus TCP		
		MCode/TCP on configuration port		
Baud rate	100 Mbps			
Configuration port	503			
Input power	Voltage	VDC	+12...+60	
	Current maximum (1)	Amp	3.5	
Motor	Frame size	NEMA	23	
		inches	2.3	
		mm	57	
	Performance levels	standard torque or premium high torque		
	Holding torque	oz-in	103...416	
N-cm		73 ... 294		
Length	stack sizes	1, 2 & 3		
Thermal	Operating temp non-condensing	Heat sink maximum	85°C	
		Motor maximum	100°C	
Protection	Type	Temp warning	0...84°C, user selectable	
		IP rating	IP20, IP65	
		Earth grounding	via product chassis ground lug	
I/O sourcing or sinking	One analog input	Resolution	12 bit	
		Voltage range	0...+5 VDC, 0...+10 VDC, 0...20 mA, 4...20 mA	
	Four signal inputs	Voltage range	+5...+24 VDC, TTL level compatible	
		Protection	over temp, short circuit, transient, over voltage, inductive clamp	
	Two power outputs	Current rating	+100...+100 mA	
		Voltage range	-24...+24 VDC	
	One high-speed signal output	Current open collector/emitter	5.5 mA	
Voltage open collector		+60 VDC		
Voltage open emitter		+7 VDC		
Aux. logic input	Voltage range (2)	+12...+24 VDC		
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)	
	Encoder	Line count	1000 lines / 4000 edges per rev	
		Style	internal, magnetic	
	Counters	Type	position, encoder/32 bit	
		Edge rate maximum	5 MHz	
	Velocity	Range	+/- 2,560,000	
		Resolution	0.5961 steps per second	
	Accel/Decel	Range	1.5 x 10 ⁹ steps per second ²	
		Resolution	90.9 steps per second ²	
Software (3)	Profinet	Output slot 1	128 bytes, 38 registers	
		Input slot 2	128 bytes, 34 registers	
		Register mapping	variable, user defined	
	EtherNet/IP	Device class	adapter	
		Message types	explicit or implicit	
		Objects	identity, assembly, TCP, Ethernet link, manufacturer specific	
	Modbus TCP	Device ID	43/14d (0x2B/0x0E)	
		Function codes	public and manufacturer specific	
MCode/TCP	Proprietary	programming over Ethernet		

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

(2) When input voltage is removed, maintains power only to control and feedback circuits.

(3) User specifies protocol type in software.



See User Manual for complete details: www.motion.schneider-electric.com/manuals.html

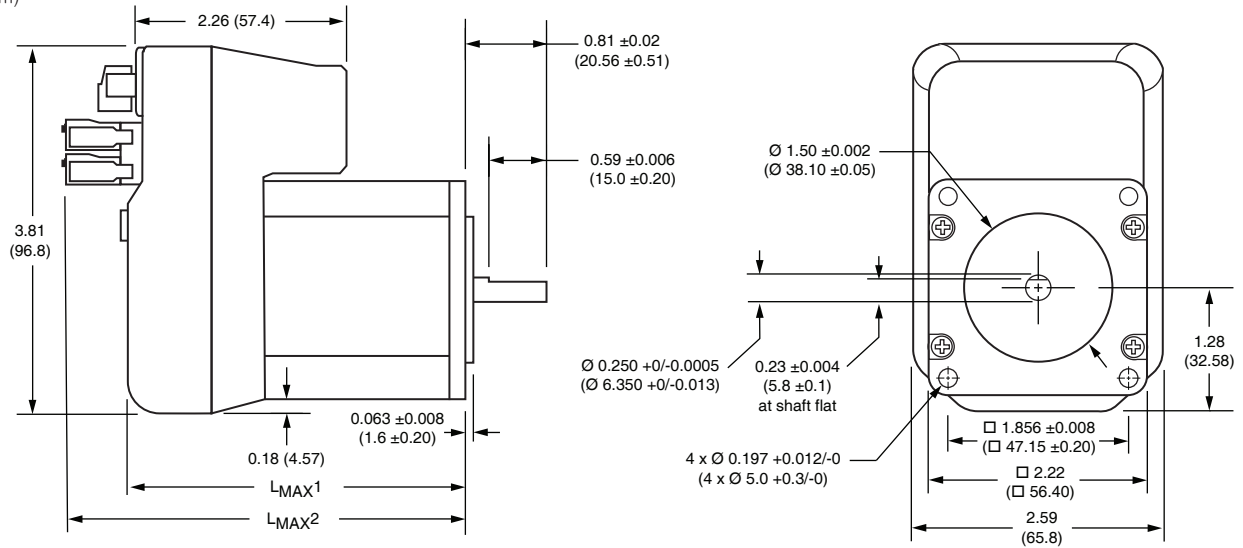
Lexium MDrive

LMD•E57 Ethernet TCP/IP

Dimensions

LM•57 NEMA23 motor, IP20-rated

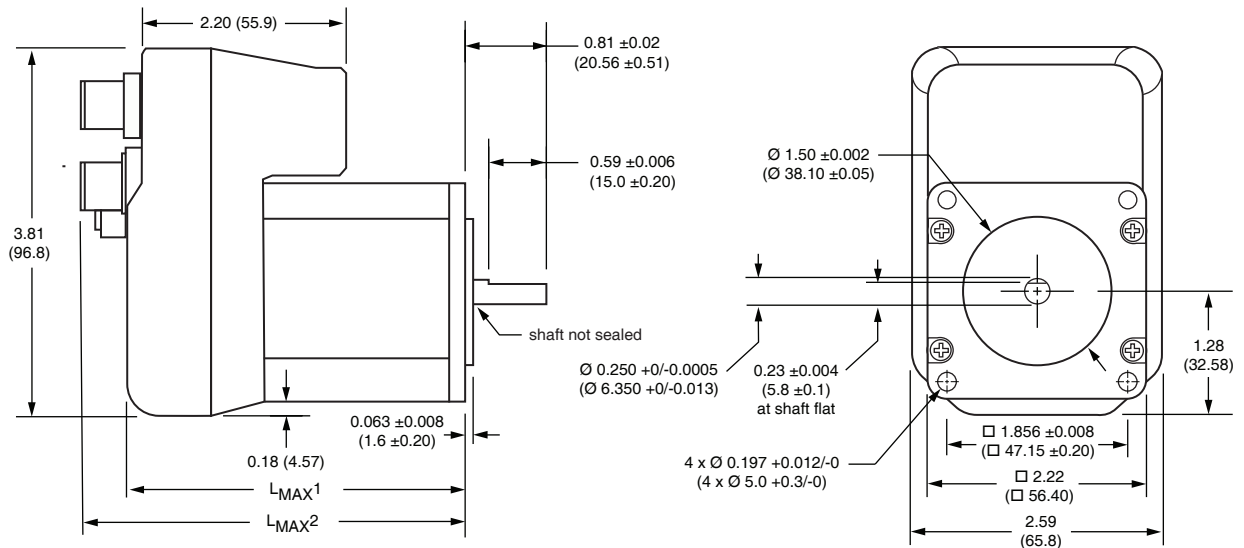
inches (mm)



Motor stack length	Lmax1		Lmax2	
	Standard - LMD	High torque - LMH	Standard - LMD	High torque - LMH
Single	3.17 (80.5)	3.32 (84.3)	3.91 (99.3)	4.01 (101.8)
Double	3.52 (89.4)	3.73 (94.8)	4.26 (108.2)	4.36 (110.7)
Triple	4.38 (111.3)	4.60 (116.8)	5.13 (130.3)	5.23 (133.0)

LM•57•C NEMA23 motor, IP65-rated

inches (mm)



Motor stack length	Lmax1		Lmax2	
	Standard - LMD	High torque - LMH	Standard - LMD	High torque - LMH
Single	3.22 (81.8)	3.32 (84.3)	3.91 (99.3)	4.01 (101.8)
Double	3.63 (92.3)	3.73 (94.8)	4.26 (108.2)	4.36 (110.7)
Triple	4.50 (114.3)	4.60 (116.8)	5.13 (130.3)	5.23 (133.0)

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IP20-rated products

LEDs

two signal indicators

Connector

P1: Power
2-pin screw lock

Chassis ground
one #6-32 screw

Connectors

P2: I/O & multifunction
2 keyed 7-pin spring lock

P3: Communication
RJ45



IP65-rated products

LEDs

two signal indicators

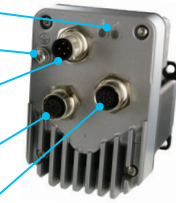
Chassis ground
one #6-32 screw

Connectors

P1: Power
M12 4-pin male

P3: Communication
M12 4-pin female

P2: I/O & multifunction
M12 12-pin male



MD-CS640-000



MD-CS620-000



MD-CS610-000

Part numbers

example part number	L	M	D	C	E	5	7	1	C
Product LMD = Lexium MDrive with standard hybrid stepper motor LMH = Lexium MDrive with high torque stepper motor	L	M	D	C	E	5	7	1	C
Control type C = Closed loop / with hMT and encoder (1) O = Open loop / no hMT or encoder	L	M	D	C	E	5	7	1	C
Communication type E = EtherNet/IP, ModbusTCP, Profinet, MCode/TCP	L	M	D	C	E	5	7	1	C
Flange size 57 = NEMA 23 2.3" / 57mm	L	M	D	C	E	5	7	1	C
Motor length 1 = single stack 2 = double stack 3 = triple stack	L	M	D	C	E	5	7	1	C
Variation — omit from part number if unwanted C = M12 circular connectors and IP65 rating	L	M	D	C	E	5	7	1	C

(1) Closed loop control delivers encoder feedback and hMT enhanced motor performance.

Accessories

description	length feet (m)	part number
IP65 cordsets Shielded cables pre-wired with straight M12 mating connectors		
Communication cordset mates to 4-pin female connector	6.5 (2.0)	MD-CS640-000
Power cordset mates to 4-pin male connector	10.0 (3.0)	MD-CS620-000
I/O cordset mates to 12-pin male connector	10.0 (3.0)	MD-CS610-000
Replacement mating connector kit Kits are for IP20 products. They include one 2-pin power mate, and one set (2 pieces) 7-pin multifunction mates		
	—	CK-15

MDrive Plus

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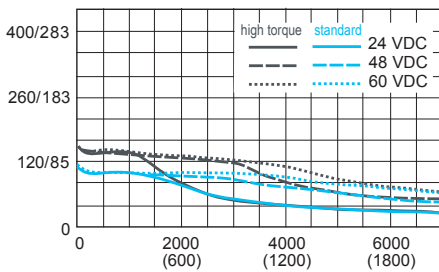
Motor performance

LMD•57 standard torque NEMA 23 motor specifications	Motor	Stack length	Single	Double	Triple
	Holding torque	oz-in		103	159
	N-cm		73	112	171
Detent torque	oz-in		3.9	5.6	9.7
	N-cm		2.7	3.9	6.9
Rotor inertia	oz-in-sec ²		0.0025	0.0037	0.0065
	kg-cm ²		0.18	0.26	0.46
Radial load limit, center of shaft	lbs		15	15	15
	kg		6.8	6.8	6.8
Axial load limit @ 1500rpm (5000 full steps/sec)	lbs		20	20	20
	kg		9	9	9
Weight (motor+driver)	oz		26.4	31.2	44.0
	g		748	885	1247
LMH•57 high torque NEMA 23 motor specifications	Motor	Stack length	Single	Double	Triple
	Holding torque	oz-in	152	264	416
	N-cm		107	186	294
Detent torque	oz-in		8.5	14.2	21.2
	N-cm		6.0	10	15
Rotor inertia	oz-in-sec ²		0.0019	0.0030	0.0065
	kg-cm ²		0.14	0.22	0.46
Radial load limit, center of shaft	lbs		15	15	15
	kg		6.8	6.8	6.8
Axial load limit @ 1500rpm (5000 full steps/sec)	lbs		20	20	20
	kg		9	9	9
Weight (motor+driver)	oz		26.4	31.2	44.0
	g		748	885	1247

LM•57 NEMA 23 speed torque (1)

Single stack length

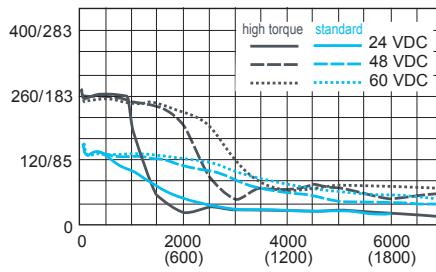
Torque in
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

Double stack length

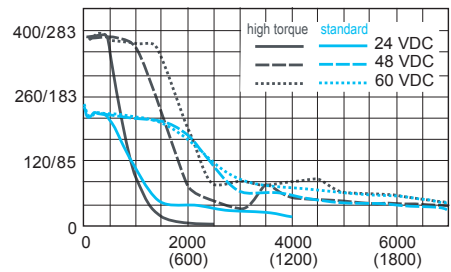
Torque in
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

Triple stack length

Torque in
Oz-In / N-cm



Speed of rotation in full steps per second (rpm)

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

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