MAXPOS Feature Chart

The MAXPOS is a fast and highly dynamic motion controller capable to efficiently control permanent magnet-activated brushed DC motors or brushless EC motors (BLDC) and is designed to support a multitude of feedbacks. It provides outstanding performance and unprecedented high dynamic features that are unique to the miniature motor drive world.

maxpos.maxonmotor.com

Field-oriented control offers the possibility to drive brushless EC motors with minimal torque ripple and low noise. A wide range of operating modes meet the highest requirements and allows flexible use in a variety of fields in industrial automation applications.

The MAXPOS is especially designed being commanded and controlled as a slave node in an EtherCAT network and is being configured via EtherCAT or USB using the graphical user interface «MAXPOS Studio» for Windows®.

Legend: ✓ = included / nnnnnn = order number / ** = available with upcoming firmware release

Feature	MAXPOS 50/5 (447293)
Product image	
Communication Interfaces	
EtherCAT	Slave
IEC 61158 Digital data communication for measurement and control Fieldbus for use in industrial control systems	Type 12 (EtherCAT)
IEC 61800-7 Generic interface and use of profiles for power drive systems	Profile type 1 (CiA 402) Device profile for drives and motion control
CAN Application Layer over EtherCAT (CoE)	✓
File transfer over EtherCAT (FoE)	✓
Distributed Clocks Support	✓
Cyclic Modes (CSP, CSV, CST) support cycle time down to	100 µs (typically 200 µs)
Process data	PDO-Mapping (Variable)
USB 2.0 / USB 3.0 (full speed)	✓
Motors	
Brushed DC motors up to	250 W / 750 W
Brushless EC motors (BLDC) up to	250 W / 750 W
Sensors (Feedback)	
Digital Hall Sensors (EC motors)	✓
Digital Incremental Encoder (2 or 3 channel with Line Driver)	✓
Analog Incremental Encoder (sin/cos, differential, 2 or 3 channel)	✓
SSI Absolute Serial Encoder (configurable)	✓
BiSS C Absolute Serial Encoder (configurable)	✓
EnDat 2.2 Absolute Serial Encoder (configurable)**	✓

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Commutation EC Motors	
Digital Hall Sensors	✓
Digital Hall Sensors + Digital Incremental Encoder	✓
Digital Hall Sensors + Analog Incremental Encoder	✓
Digital Hall Sensors + Absolute Serial Encoder	✓
Absolute Serial Encoder**	✓
Electrical Data	
Nominal power supply voltage ($+V_{CC}$)	10…50 VDC
Nominal logic supply voltage ($+V_C$)	10…50 VDC
Absolute supply voltage limits ($+V_{min}$ / $+V_{max}$)	8 VDC / 56 VDC
Output voltage (max.)	0.95 x $+V_{CC}$
Output current (I_{cont} / I_{max} <1.5 s)	5 A / 15 A
Pulse width modulation frequency	100 kHz
Sampling rate PI – current controller	100 kHz (10 µs)
Sampling rate PID – speed controller	10 kHz (100 µs)
Sampling rate PID – positioning controller	10 kHz (100 µs)
Max. efficiency	96%
Max. speed DC motor	limited by max. permissible speed (motor) and max. output voltage (controller)
Max. speed EC motor (sinusoidal)	200'000 rpm (1 pole pair)
Built-in motor choke	3 x 10 µH; 5 A
Inputs / Outputs	
Hall sensor signals	H1, H2, H3 for Hall effect sensor ICs (Schmitt trigger with open collector output)
Digital incremental encoder signals	A, A\, B, B\, I, I\ (max. 5 MHz)
Sensor signals (digital incremental, analog incremental, absolute serial (SSI / BiSS / EnDat**))	A, A\, B, B\, I, I\ Clock+, Clock– Data+, Data–
Digital inputs	6 (galvanic isolated)
Digital outputs	4 (galvanic isolated)
Hall sensor supply voltage	+5 VDC (I_L ≤30 mA)
Encoder supply voltage	+5 VDC (I_L ≤70 mA)
Sensor supply voltage	+5 VDC (I_L ≤150 mA)
Auxiliary output voltage	$+V_{cc}$ > 30 VDC: $+V_{OUT}$ = +24 VDC (I_L ≤300 mA) $+V_{cc}$ < 30 VDC: $+V_{OUT}$ = $+V_{CC}$ - 5 V (I_L ≤300 mA)
Status indicators «Axis Status»	Bicolor LED (red/green)
Status indicators «EtherCAT Status»	Bicolor LED (red/green)
Status indicators «EtherCAT Port Activity/Link State»	LED (green)

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Connections		
X1	Power Supply	Molex Mini-Fit Jr. header, dual row (4.2 mm), 2 poles, right angle
X2	Logic Supply	Molex Mini-Fit Jr. header, dual row (4.2 mm), 2 poles, right angle
X3	Motor	Molex Mini-Fit Jr. header, dual row (4.2 mm), 4 poles, right angle
X4	Hall Sensor	Molex Micro-Fit 3.0 header, dual row (3.0 mm), 6 poles, right angle
X5	Encoder	Pin header (2.54 mm), 5 x 2 poles
X6	Sensor	Molex Micro-Fit 3.0 header, dual row (3.0 mm), 10 poles, right angle
X7	Signal Input	Molex Micro-Fit 3.0 header, dual row (3.0 mm), 12 poles, right angle
X8	Signal Output	Molex Micro-Fit 3.0 header, dual row (3.0 mm), 8 poles, right angle
X9	EtherCAT IN	RJ45 10/100-BASE-TX
X10	EtherCAT OUT	RJ45 10/100-BASE-TX
X11	USB	USB Type micro B, female
Mechanical Data		
Weight (approximate)		302 g
Dimensions (L x W x H)		140 x 103.5 x 27 mm
Mounting holes		for screws M4
Environmental Conditions		
Temperature – Operation		–30…+45°C
Temperature – Extended range		+45…+56°C Derating: –0.455 A/°C
Temperature – Storage		–40…+85°C
Altitude – Operation		0…6'000 m MSL
Altitude – Extended range		6'000…10'000 m MSL Derating: see Hardware Reference for details
Humidity (condensation not permitted)		20…80%
Directives & Standards		
Generic		IEC/EN 61000-6-2; IEC/EN 61000-6-3
Applied		IEC/EN 55022 (CISPR22); IEC/EN 61000-4-2; IEC/EN 61000-4-3; IEC/EN 61000-4-4; IEC/EN 61000-4-6; IEC/EN 61000-4-8
Environment		IEC/EN 60068-2-6; MIL-STD-810F
Safety		UL File Number E243951 and E207844; unassembled printed circuit board
Reliability		MIL-HDBK-217F (MTBF 149'081 hours)

Feature	MAXPOS 50/5 (447293)
Functionality	
Operating Modes	
Cyclic Synchronous Position Mode (CSP)	✓
Cyclic Synchronous Velocity Mode (CSV)	✓
Cyclic Synchronous Torque Mode (CST)	✓
Profile Position Mode	✓
Profile Velocity Mode	✓
Homing Mode	✓
Features	
Feed Forward (acceleration/velocity for inertia and friction compensation)	✓
Field-oriented Motor Control (FOC)	✓
Advanced automatic control settings (Auto Tuning)	✓
Safe Torque Off (STO) (based on IEC/EN 61800-5-2, without certification)	✓
Digital I/O Functionality	
Inputs (configurable)	✓
Touch Probe	✓
Reference switches	✓
Limit switches	✓
Safe Torque Off (STO) inputs	✓
General purpose	✓
Outputs (configurable)	✓
Position Compare**	✓
Control of holding brakes	✓
Safe Torque Off (STO) output	✓
General purpose	✓
Built-in Protection	
Current limit	✓
Overcurrent	✓
Excess temperature	✓
Overvoltage	✓
Undervoltage	✓
Voltage transients	✓
Short-circuits of motor cable	✓
Loss of feedback	✓
Following error	✓
Status reporting	✓
Firmware error handling	✓

Feature		MAXPOS 50/5 (447293)
Software		
Installation Program		MAXPOS Setup
Graphical User Interface		MAXPOS Studio
	Startup	✓
	Regulation Tuning	✓
	Diagnostics**	✓
	Firmware Update	✓
	Motion Commander	✓
	I/O Monitor	✓
	Parameters	✓
	Data Recording	✓
	Online Help	✓
Language		English
Operating System		Windows 8, Windows 7, Windows XP SP3
Accessories (not included in delivery)		
275934	Encoder Cable	✓
422827	Ethernet Cable	✓
275878	Hall Sensor Cable	✓
451746	MAXPOS 50/5 Connector Set	✓
459639	MAXPOS USB Stick	✓
275851	Motor Cable	✓
275829	Power Cable	✓
451290	Sensor Cable 5x2core	✓
451291	Signal Cable 12core	✓
451292	Signal Cable 8core	✓
403968	USB Type A - micro B Cable	✓