maxon motor

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.

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®.

maxpos.maxonmotor.com

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
Process data	PDO-Mapping (Variable)
USB 2.0 / USB 3.0 (full speed)	✓
Motors	
Brushed DC motors up to	250 W
Brushless EC motors (BLDC) up to	250 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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Feature	MAXPOS 50/5 (447293)
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} @ TBD 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 (galvanically isolated)
Digital outputs	4 (galvanically 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)
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

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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 with derating	TBD
Temperature – Storage	–40…+85°C
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 TBD
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)	✔

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Feature	MAXPOS 50/5 (447293)
Digital I/O Functionality	
Inputs (configurable)	✔
Position Marker** / 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	✔
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

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Feature		MAXPOS 50/5 (447293)
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	✔