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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.maxongroup.com

Legend: ✓ = included   /   nnnnnn = order number

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)	✓

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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	✔
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.)	$0.95 \times +V_{CC}$
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))	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 ≤145 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)		5…90%
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 E76251, E207844, E229342, and E243951; 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), not certified	✔
Digital I/O Functionality	
Inputs (configurable)	✔
Touch Probe	✔
Reference switches	✔
Limit switches	✔
Safe Torque Off (STO) inputs	✔
General purpose	✔
Outputs (configurable)	✔
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	✔
Firmware Update	✔
Motion Commander	✔
I/O Monitor	✔
Parameters	✔
Data Recording	✔
Online Help	✔
Language	English
Operating System	Windows 10, 8, 7
Accessories (not included in delivery)	
275934 Encoder Cable	✔
422827 Ethernet Cable	✔
275878 Hall Sensor Cable	✔
451746 MAXPOS 50/5 Connector Set	✔
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	✔

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