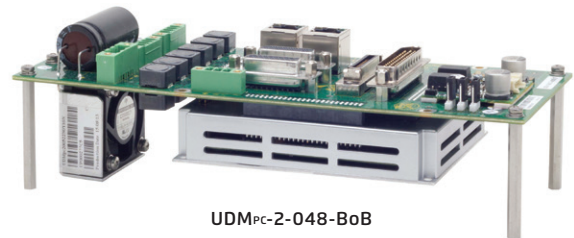# UDMPC

EtherCAT® Single & Dual Axis Drive Module

- Universal single and dual axis Drive Modules for EtherCAT networks

- 24Vdc to 48Vdc, up to 10A continuous and 20A peak current (400W/800W)

- Digital control for easy setup and diagnostics

- Supports AC Servo / DC brushless, DC Brush, voice coils and closed and open loop step motors

- Dual loop with dual feedback per each axis

- 20kHz sampling and update rate of all control loops

- Digital I/O: 10 inputs, 6 outputs
  Analog I/O: 4 inputs, 2 outputs, 12 bit resolution

- Safe Torque Off (STO)

UDMPC-2-048-BoB

The UDMPC is a line of EtherCAT universal single and dual axis drives for AC servo /DC Brushless, DC brush, two- and three-phase step motors. The module is designed to be mounted on a carrier board.

The UDMPC operates as an EtherCAT slave under any SPiiPlus EtherCAT master Controller including the PC based SPiiPlusSC Soft Controller. It is designed to address high performance applications with demanding move & settle, smooth velocity and stand still jitter requirements with power of up to 400W/800W (continuos/peak) per axis.

The UDMPC is offered with the following current levels: 2.5A/5A (cont./peak), 5A/10A and 10A/20A. Optional Safe Torque Off (STO) module cuts the power to the motor without removal of the power source to comply with SIL-3 and PLe safety levels.

The module can be provided with the optional UDMPC-2-048-BOB BreakOut carrier Board and a set of mating connectors. This carrier board also enables the user to configure the safety and general purpose inputs and outputs (5V, 24V, sink or source); test the STO operation and set the network ID of the unit.

In-Position Technologies
www.iptech1.com

CE, UL
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ACS
MOTION CONTROL

Specifications

Part Number X represents number of axes XX represents other ordering options	UDM_PC X-002-XX	UDM_PC X-005-XX	UDM_PM X-010-XX
Number of Axes		1 or 2	
Input voltage range [Vdc]		24 to 48	
Phase Current Cont./Peak, sine amplitude [A]	2.5 / 5	5 / 10	10 / 20
Phase Current Cont./Peak, RMS [A]	1.8 / 3.6	3.6 / 7.1	7.2 / 14.2
Peak current time [sec]		1	
Max. output voltage		Vdc x 99%	
Max. Input cont. power per axis at 48Vdc [kVA]	105	210	420
Max. output power (Cont./Peak) per axis @ 48Vdc [kW]	100 / 200	200 / 400	400 / 800
Min. load Inductance, at maximum motor voltage [mH]. With a lower voltage the min. inductance value can be reduced proportionally		0.05	
Max. Heat dissipation per axis [W]	2	5	12
Weight [gram]		180	
Dimensions [mm] Dimensions with BoB [mm]		111x86x20 177x86x58	
Standards		CE, UL	

Note: For cooling use fan with airflow of 25CFM

Example: UDM_PC200522N0Y10NR

Field	1	2	3	4	5	6	7	8	9	10	11
PN UDM_PC	2	005	2	2	N	0	Y	1	0	N	R

Ordering Options

Ordering options	Field	Example User Selection	Values
Number of axes	1	2	1,2
Continuous Current (Peak is double)	2	005	002- 2.5A, 005- 5A, 010- 10A
Number of 250kHz Sin-Cos encoder interfaces	3	2	0,1,2
Encoder channels per axis	4	2	1,2
Absolute encoders type	5	N	N- None, E- EnDat 2.1(digital)/2.2, P- Panasonic, H- Hiperface, S- Smart Abs, B- Biss-A/B/C, I- SSI
Number of Absolute encoders interface	6	0	0,1,2
UDM_PC2-048-BOB kit, assembled	7	Y	Y- Yes, N- No
EtherCAT Master	8	1	1 - Any
Type of motors	9	0	0 - Any
Installed heatsink	10	N	N- No

I/O configuration	11	R	N- Inputs & limits: 24V/SOURCE (PNP),
			    Outputs: 24V/SOURCE (PNP).
			D- Identical to (N), For compatability
			    reasons.
			S- Inputs & limits: 24V/SINK (NPN).
			    Outputs: 24V/SOURCE (PNP).
			R- Inputs & limits: 5V/SOURCE (PNP).
			    Outputs: 5V/SOURCE (PNP).
			T- Inputs & limits: 5V/SINK (NPN).
			    Outputs: 5V/SOURCE (PNP).
			U- Outputs & Inputs: 24V/SOURCE (PNP),
			    Limits: 24V/SINK (NPN)

Servo

A standard comprehensive set of powerful algorithms to enhance accuracy, move & settle time, smooth velocity, stability and robustness.
• Advanced PIV cascaded structure • Loop shaping filters • Gain Scheduling • Gantry MIMO control • Dual feedback / loop control • Disturbance rejection control
Optional Servoboost™ algorithem that provides better, more consistent servo performance, insensitive to noise and large changes in the system.

Drives

Type: digital current control with field oriented control and space vector modulation.
Current ripple frequency: 40 kHz. Current loop sampling rate: 20 kHz
Programmable Current loop bandwidth: up to 5 kHz
Commutation type: sinusoidal. Initiation with and without hall sensors
Switching method: advanced unipolar PWM
Protection: Over voltage, phase-to-phase short, short to ground, over current, over temperature

Supply

The module is fed by two power sources.
A motor supply and a 24Vdc control supply.
During emergency conditions there is no need to remove the 24Vdc control supply.
Motor Supply: Range: 24Vdc to 48Vdc
Current rating should be calculated based on actual load.
Control Supply: Range: 24Vdc ± 10%
Maximum input power: 15W
Input current: <0.6A

Motor Types

Two- and three-phase permanent magnet synchronous (DC brushless/AC servo), DC brush, Voice coil, Two- and three-phase stepper (micro-stepping open or closed loop).

Feedback

Types: incremental digital encoders, optional: Sin-Cos encoders, Resolver, absolute encoders
Incremental Digital Encoder: Four, two per axis, A&B,I; Clk/Dir,I
Type: RS-422
Max. rate: 50 million encoder counts/sec.
Protection: Encoder error, not connected
Sin-Cos Analog Encoder (optional): Two, one per axis. Type: 1Vptp, differential.
Programmable multiplication factor: x4, to x4,096
Maximum frequency: 250kHz Automatic compensation of Offset, Phase and Amplitude
Maximum acceleration with Sin-Cos encoder: 10^8 sine periods/second^2.
Protection: Encoder error, not connected
Absolute encoders (optional): EnDat 2.1(Digital)/2.2, Panasonic, Hiperface, Smart Abs, Biss-A/B/C, SSI. Consult ACS for availability
Hall inputs: Two sets of three per axis.
Type: single-ended, 5V, source, opto-isolated.
Input current: <7mA.
5V feedback supply: The total current available for feedback devices is 400mA.
If more current is needed, then it is recommended to implement such a supply on the carrier board.

Digital I/O

Safety Inputs: Left and right limit inputs per axis.
Type: 5Vdc, single-ended, selectable sink / source, opto-isolated.
Input circuit current: 4-14mA
E-Stop: Opto-isolated, floating two-terminal
STO: Two pairs of inputs. The STO circuit and application interface should be mounted on the carrier board.
General Purpose Digital Inputs: Eight, 5V, single-ended, selectable sink/source, optoisolated.
Input current: 4-14mA
Note: 24V inputs, sink or source can be implemented on the carrier board.

Registration Mark: Two, RS422. Both inputs can be assigned to one axis or each can be assigned to a different axis. Can be used as GP inputs.
Two GP opto isolated inputs can be programmed to be used as the mark inputs.
General Purpose Digital Outputs: Four, opto-isolated, floating two-terminal, 15mA per output.
Note: 24V or 5V outputs, sink or source with the appropriate current can be implemented on the carrier board.
Position Event Generator (PEG): Two, RS422 Both outputs can be assigned to one axis or each can be assigned to a different axis. Can be used as GP outputs.
Two GP opto isolated outputs can be programmed to be used as the PEG Pulse outputs.
Pulse width with RS422 outputs: 26nSec to 1.75mSec
Maximum rate with RS422 outputs: 10MHz
Pulse width with GP outputs: 0.75mSec to 1.75mSec
Maximum rate with GP outputs: 1kHz

Analog I/O

Analog Inputs: Four inputs, ±10V, differential, 12 bit resolution. 20kHz sampling rate.
Can be used as feedback to the servo loops.
Analog Outputs: Two outputs, ±10V, differential, 12 bit resolution. 20kHz update rate

Environment

Operating range: 0 to + 40°C
Storage and transportation range: -25 to +70°C
Humidity (operating range): 5% to 90% non-condensing

Communication

Two EtherCAT ports, In and Out

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