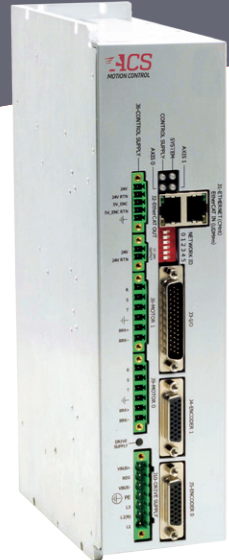


# UDM<sub>PM</sub>

## EtherCAT<sup>®</sup> Single & Dual Axis Drive Module



- Universal single and dual axis Drive Modules for EtherCAT networks
- 85 to 265Vac (or 120 to 375Vdc), up to 7.5A continuous and 15A peak current (~1.6kW/3.2kW@230Vac)
- Digital control for easy setup and diagnostics
- Dual loop with dual feedback per each axis
- 20kHz sampling and update rate of all control loops
- Supports incremental digital and analog encoders, absolute encoders and resolver
- Digital I/O: 8 inputs, 8 outputs Analog I/O: 4 inputs, 12 bit resolution; 2 outputs, 10 bit resolution
- Safe Torque Off (STO)

The UDM<sub>PM</sub> is a line of EtherCAT universal single & dual axis economical drives for AC servo/DC Brushless, DC brush, voice coil, and stepper motors.

The UDM<sub>PM</sub> operates as an EtherCAT node under any SPiiPlus EtherCAT master Controller including the PC based SPiiPlusSC Soft Controller. It is designed to address cost sensitive applications requiring better move & settle, smooth velocity and stand still jitter performance with power of up to 1.6kW/3.2kW (continuous/peak) per axis.

The UDM<sub>PM</sub> is offered with two current levels: 5A/10A (cont./peak) and 7.5A/15A.

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 UDM<sub>PM</sub> is powered by a single phase 85 to 265Vac (or 120 to 375Vdc) and by a separate 24Vdc control supply that keeps all low voltage signals alive during emergency conditions.

**In-Position  
Technologies**  
www.iptech1.com

**CE, UL (Pending)**

EtherCAT<sup>®</sup> is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

Contact us: [sales@acsmotioncontrol.com](mailto:sales@acsmotioncontrol.com) | [www.acsmotioncontrol.com](http://www.acsmotioncontrol.com)

**ACS**  
MOTION CONTROL

## Specifications

Part Number X represents number of axes XX represents other ordering options	UDM <sub>PM</sub> X-002-XX	UDM <sub>PM</sub> X-005-XX	UDM <sub>PM</sub> X-007-XX
Number of Axes	1 or 2		
Input voltage range [Vac]	85 to 265		
Input voltage range [Vdc]	120 to 375		
Phase Current Cont./Peak, sine amplitude [A]	2.5/5	5/10	7.5/15
Phase Current Cont./Peak, RMS [A]	1.8/3.6	3.6/7.1	5.4/10.8
Peak current time [sec]	1		
Max. output voltage	Vdc x 1.41 x 88%		
Max. Input cont. power per axis @ 230Vac [kVA]	0.9/1.8	1.6	2.5
Max. output power (Cont./Peak) per axis @ 230Vac [kW]	0.55/1.1	1.1/2.2	1.6/3.2
Min. load Inductance, at maximum motor voltage [mH]. With a lower voltage the min. inductance value can be reduced proportionally	1		
Max. Heat dissipation per axis @ 230Vac [W]	25	50	75
Weight without [gram]	2,000		
Dimensions [mm <sup>3</sup> ]	270 x 157 x 67		
Standards	CE, UL (Pending)		

Note: For cooling use fan with airflow of 25CFM

### 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

### 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 circuit, Short to ground, Over current, Over temperature

### Supply

The module is fed by two power sources. A motor AC supply and a 24Vdc control supply. During emergency conditions there is no need to remove the 24Vdc control supply.

#### Motor Supply

Range: 85 to 265Vac or 120 to 375Vdc  
Current rating should be calculated based on actual load.

#### Control Supply

Range: 24Vdc ± 10% Maximum input current/power: 4A/100W  
Note: The module consumes 2A (50W). Additional 2A are needed when the motor brake feature is used

### 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

**Incremental Digital Encoder:** Four, two per axis, A&B, I; Clk/Dir, I RS-422. Max. rate: 50 million encoder counts/sec., Protection: Encoder error, not connected

**Sin-Cos Analog Encoder (optional):**

Two, one per axis. 1Vpt, differential  
Multiplication factor: From x4, to- x4,096  
Maximum frequency: 250kHz  
Automatic compensation of Offset, Phase and Amplitude

Maximum acceleration: 10<sup>8</sup> million sine periods/sec<sup>2</sup>. Protection: Encoder error, not connected

**Hall inputs:** Two sets of three per axis. Single-ended, 5V, source, opto-isolated.  
Input current: <7mA.

**Resolver:** 12b resolution (4,096 counts/rev)

**Absolute encoders (optional):** EnDat 2.1(Digital)/2.2, Smart-ABS, Panasonic, BiSS-A/B/C, SSI, Hiperface. Consult ACS for availability

**5V feedback supply:** Total current available for feedback devices: 250mA.

### Digital I/O

**Safety Inputs:** Left + right limit per axis. Single-ended, 24V±20%, opto\_isolated, source. (See ordering options for other configurations)  
Input current: 4-14mA. E-Stop: Opto-isolated, floating two-terminal.

**Motor Brake outputs:** Two. 24V, 1A ,opt\_ isolated. Powered by the 24V Control Supply.

**STO:** Two pairs of inputs. (Optional)

**General Purpose Inputs:** Eight, Single-ended, 24V±20%, opto-isolated, source. (See ordering options for other configurations)  
Input current: 4-14mA

## Ordering Options

Ordering options	Field	Example	Values
Number of drives (85Vac - 265Vac)	1	2	1,2
Continuous Current (Cont/Peak)	2	007	002- 2.5A, 005- 5A, 007- 7.5A
250kHz SIN-COS (LT)	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, S- Smart-ABS, P- Panasonic, B- BiSS-A/B/C, H- Hiperface, R- Resolver, I- SSI
Number of Absolute encoders interface	6	0	0,1,2
STO	7	Y	Y- Yes, N- No
EtherCAT Master	8	1	1 - Any ACS EtherCAT Master
I/O configuration	9	N	<b>N:</b> Inputs & limits: 24V/SOURCE (PNP), outputs: 24V/SOURCE (PNP). <b>D:</b> Identical to (N). For compatibility reasons. <b>S:</b> Inputs & limits: 24V/SINK (NPN), Outputs: 24V/SOURCE (PNP). <b>U:</b> Inputs: 24V/SOURCE (PNP), Limits: 24V/SINK (NPN), Outputs: 24V/SOURCE (PNP).

Example: UDM<sub>PM</sub>200722N0Y1N

Field	1	2	3	4	5	6	7	8	9	
PN	UDM <sub>PM</sub>	2	007	2	2	N	0	Y	1	N

**Registration MARK:** Four. Two are RS422 with dedicated inputs and can be used as GP inputs. Two share General Purpose Inputs 6,7.

**General Purpose Outputs:** Eight. Single-ended, 24V±20%, opto-isolated, source. 0.5A per output with up to 3A for all outputs.

**Position Event generator (PEG):** Two PEG\_Pulse and two PEG\_State, RS422. Flexible axis assignment. 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

**HSSI:** One channel. RS422

### Analog I/O

Input: Two per axis. differential, ±10V, 12bit resolution, 100mV compensated offset, maximal sampling rate 250kHz

Output: Two. 10 bit resolution, differential ±10V±10%, 50mV maximal offset, 50mVp\_p max ripple, linearity better than 1%

### Environment

Operating: 0 to + 50°C  
Storage : -25 to +70°C  
Humidity: 5% to 90% non-condensing  
Communication  
EtherCAT: Two, In & Out, RJ45 connectors

### Accessories

SPii+CMntUDMpm-ACC1: CMnt-x & UDMpm-x mating connectors kit  
SPii+CMntUDMpm-ACC2: CMnt & UDMpm J11 mating connector + 2m cable, flying leads  
STO-ACC1: 2 meter cable with flying leads for STO

For the latest updates visit our website at [www.acsmotioncontrol.com](http://www.acsmotioncontrol.com)

