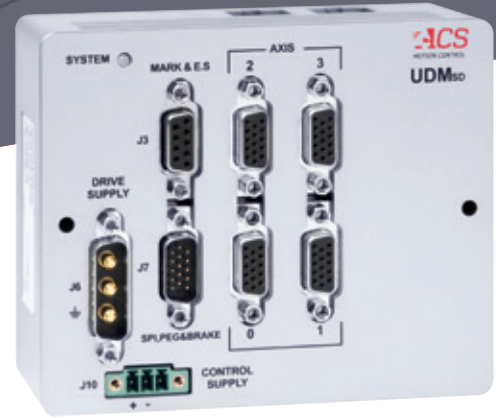


# UDM<sub>SD</sub>



## EtherCAT<sup>®</sup> Dual/Quad Axis Drive Module

- Universal dual/quad EtherCAT<sup>®</sup> Drive Modules
- 12Vdc to 48Vdc, up to 2.5A continuous and 5A peak current
- Digital control for easy setup and diagnostics
- Supports any of the following motor types by software settings only: 2, 3 phase  
AC Servo / DC brushless with sinusoidal commutation,  
DC Brush, voice coils, closed and open loop step motors
- Feedback  
4 digital incremental encoders  
2 absolute encoders (optional)
- Digital I/O  
Inputs: 4 Registration Mark  
Outputs: 1 PEG, 2 motor brake (24V, 0.5A)
- Small enclosure: 121x100x48 mm<sup>3</sup>
- SPI interface for special feedback devices
- Sub-D connectors

The UDM<sub>SD</sub> is a series of compact EtherCAT modules with dual/quad-axis universal drives for servo, step, and voice coil motors with a continuous power range of 10W to 100W (200W peak). The type of motor is selected by the user and can be set differently for each drive.

The UDM<sub>SD</sub> addresses the needs of demanding multi-axis motion applications with limited space, such as moving inspection heads, small manipulators, and table-top motion stages. The small size, low weight, and minimal cable interface makes the UDM<sub>SD</sub> ideal for mounting remotely on moving axes. It is available with currents of 1.25/2.5A and 2.5/5A (cont./peak).

The UDM<sub>SD</sub> supports four digital incremental and two absolute encoders.

It includes a Serial Peripheral Interface (SPI) to support other feedback devices, such as autofocus signals.

The unit is powered by a 12 to 48Vdc drive supply voltage and by a separate 24Vdc  $\pm 20\%$  control supply that keeps all logic signals alive during emergency conditions.

All connectors of the motors, the encoders and the I/Os are sub-D type connectors.

The UDM<sub>SD</sub> is panel or din rail mountable.

The unit is supplied with the drive and control connectors.

**CE** (Pending), **UL**

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

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## Specifications

|  | UDM <sub>SD</sub><br>A | UDM <sub>SD</sub><br>B |
|--|------------------------|------------------------|
| Number of axes   | 2,4                    | 2,4                    |
| Motor voltage input range [Vdc]                        | 12-48                  |                        |
| Control voltage input [Vdc]                            | 24 ±20%                |                        |
| Phase current (Cont./ Peak)<br>Sine amplitude [A]      | 1.25/2.5               | 2.5/5                  |
| Phase current (Cont./ Peak) RMS [A]                    | 0.9/1.8                | 1.8/3.6                |
| Peak current time [sec]                                | 1                      |                        |
| Max. output voltage<br>to motor [Vdc]                  | (Drive supply) x 93%   |                        |
| Max. RMS input current<br>at 48Vdc [W]                 | 4.3                    | 8.6                    |
| Min. load Inductance, at maximum<br>motor voltage [mH] | 0.050                  |                        |
| Max. Heat dissipation per axis [W]                     | 0.7                    | 2                      |
| Weight [gram]  | 304                    |                        |
| Dimensions [mm <sup>3</sup> ]                          | 121x100x48             |                        |
| Standards  | CE (pending), UL       |                        |

### 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 (2.5/5model only)
- Dual feedback / loop control
- Disturbance rejection control

Optional Servoboost™ algorithm 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, motor phase-to-phase short circuit, motor phase to ground short circuit, over-current, over-temperature

### Supplies

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

#### Drive Supply

Range: 12Vdc to 48Vdc

Current rating should be calculated based on actual load

#### Control Supply

Range: 24Vdc ±20%

Maximum input power: 15W

Input current: < 1A

### Motor Type

Universal drive, DC Brushless (AC Servo), DC brush motors, AC Induction

## Ordering Options

| Ordering options                      | Field | Example user selection | Values   |
|---------------------------------------|-------|------------------------|--|
| Number of axes                        | 1     | 4                      | 2,4  |
| Continuous Current (Peak is double)   | 2     | A                      | A-1.25A, B-2.5A  |
| Total number of feedback channels     | 3     | 4                      | 2, 4 (4-axis unit & 2-axis 5A unit requires 4)   |
| Absolute encoders type                | 4     | N                      | N- None, E- EnDat 2.1(Digital)/2.2, S- Smart Abs, P- Panasonic, B- BISS-A/B/C, I- SSI  |
| Number of Absolute encoders interface | 5     | 0                      | 0,1,2  |
| I/O configuration                     | 6     | R                      | <b>N- Inputs &amp; limits:</b> 24V/SOURCE (PNP),<br><b>Outputs:</b> 24V/SOURCE (PNP).<br><b>D-</b> Identical to (N), for compatibility reasons<br><b>S- Inputs &amp; limits:</b> 24V/SINK (NPN).<br><b>Outputs:</b> 24V/SOURCE (PNP).<br><b>R- Inputs &amp; limits:</b> 5V/SOURCE (PNP).<br><b>Outputs:</b> 5V/SOURCE (PNP).<br><b>T- Inputs &amp; limits:</b> 5V/SINK (NPN).<br><b>Outputs:</b> 5V/SOURCE (PNP) |

### Example: UDM<sub>SD</sub>4A4N0R

| Field | 1                 | 2 | 3 | 4 | 5 | 6   |
|-------|-------------------|---|---|---|---|-----|
| PN    | UDM <sub>SD</sub> | 4 | A | 4 | N | 0 R |

### Feedback

**Types:** incremental digital encoders, optional: absolute encoders

**Incremental Digital Encoder:** Up to four, one per axis. A&B,I and Clk/Dir, Type: Differential RS-422

Max. rate: 50 million encoder counts/sec

Protection: Encoder error, not connected

**Absolute encoders (optional):** Up to two. EnDat 2.1(Digital)/2.2, Panasonic, SmartABS, and BISS-C, SSI

**5V feedback supply:** Feedback devices are fed by a 5V±5% supply.

Total available current to all encoders is 1A

### Digital I/O

**Safety Inputs:** Left and right limit inputs per axis

Type: Single-ended, 24V±20%,opto isolated, source E-Stop: 24V, Max., opto isolated, two terminal, input current 14mA Unused safety inputs can be used as general purpose inputs

**Registration MARK (High Speed Position Capture):** Four. Fast, 24V±5%, opto-isolated, 'sink' type. 10mA max. input current. can be used as general purpose fast inputs

**Motor Brake Outputs:** Two, opto-isolated, 24V±20%, 0.5A per output.

Can be used as general purpose outputs

**Position Event Generator (PEG):** One, RS422. Can be used as general purpose output. Pulse width 26nSec to 1.75mSec

Maximum rate with RS422 outputs: 10MHz

**SPI Interface** One. Requires customized software to activate.

Consult ACS representative

### Environment

Operating range: 0 to + 50°C

Storage and transportation range: -25 to +70°C

Humidity (operating range): 5% to 90% non-condensing

### Communication

Two EtherCAT ports, In and Out

### Accessories

UDM<sub>SD</sub>-ACC1 Mating connectors' set

UDM<sub>SD</sub>-ACC2 Din-rail mounting kit

UDM<sub>SD</sub>-ACC3 Mating connectors with 1.5m cables with flying leads, 4 axes