

UDM_{MC}



EtherCAT[®] Dual & Quad Axis Drive Module

- Universal dual/quad motor Drive Modules for EtherCAT networks
- 12Vdc to 80Vdc, up to 20A continuous and 40A peak current
- Outstanding servo performance
20kHz sampling rate
Advanced algorithms including ServoBoost™ (optional)
Gantry MIMO Control
Dual feedback
- Digital control for easy setup and diagnostics
- Supporting any of the following type of motors 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
4 absolute encoders (optional)
- Digital I/O (all can be used as general purpose I/O)
Inputs: 4 Registration MARK (High Speed Position Capture)
Outputs: 1 PEG (Position Event Generator), 4 motor brake (24V, 0.5A)
- Safe Torque Off (optional)
- Four axis units can be ordered also with mix current levels:
2 x 5A & 2 x 10A
2 x 5A & 2 x 20A
2 x 10A & 2 x 20A
- Compact footprint: 152 x 138 x 48 mm³

The UDM_{MC} is a line of compact EtherCAT modules of two and four universal drives with rating of 12 to 80Vdc and 2.5A (5A peak) to 20A (40A peak) per drive. Each drive is programmable to control a 3 & 2 phase servo motor, a DC brush motor, a voice coil motor and a 2 & 3 phase step motor.

The UDM_{MC} addresses the needs of demanding multi-axis motion applications with limited space, such as wafer-handling robots, wire bonders, die bonders, electronics packaging, small manipulators, and table-top motion stages.

With the optional powerful ServoBoost™ algorithm (ordered with the controller), demanding positioning systems can achieve ultimate performance levels, such as speeds of meters per seconds and Nanometers of jitter, minimal settling time, and uncompromising system robustness with minimal sensitivity to disturbances and changes. Optional Safe Torque Off (STO) cuts the power to the motor without removal of the power source for applications that are required to comply with SIL-3 and PLe safety levels. The UDM_{MC} is a slave that runs under any ACS' EtherCAT masters.

The 4-axis UDM_{MC} can be ordered with mixed current specifications. See Ordering Options.

A comprehensive set of software support tools are provided for configuration, setup, tuning and diagnostics.

CB, UL recognized

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ACS
MOTION CONTROL

Specifications

Per Drive	2.5A	5A	10A	20A
Continuous/peak current Sine amplitude [A]	2.5/5	5/10	10/20	20/40
Continuous current RMS [A]	1.75/3.5	3.5/7	7/14	14/28
Heat dissipation [W]	1	1.2	3	8
Maximum cont./peak output power @ 80Vdc [W]	155/310	313/625	625/1250	1250/2500
Maximum cont Input current [A]	2	4	8	16
Peak current time [sec]	1			
Minimum load inductance @80Vdc [mH]. Can be derated linearly for lower voltages	0.05			

Per module	
Maximum cont input current per module [A]	40
Maximum motor voltage [Vdc]	(Vin motor) x 92%

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 & under voltage, Phase to phase and phase to ground short, Over current, Over temperature

Supply

The drive must be supplied by two power sources A motor supply and a 24Vdc control & logic supply. During emergency conditions there is no need to remove the 24Vdc control supply.

Motor Supply: Range: 12Vdc to 80Vdc
 Current rating should be calculated based on actual load.

External shunt power resistor, activated at 83V, should be added in parallel to motor supply, which must not exceed 85V under any operating conditions.

Control Supply Control supply input voltage: 24Vdc ± 20%

Maximum input power:
 Without motor brakes: 19W (0.8A @ 24Vdc)
 With 4 motor brakes: 67W (2.8A @ 24Vdc)

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), Five-phase stepper*.

* Consult ACS.

Feedback

Types: incremental digital encoders, optional: absolute encoders

Incremental Digital Encoder: Four, one per axis. A&B,I and Clk/Dir, Type: Differential RS-422 or single-ended

Max. rate: RS-422 - 50M quad counts/sec, Single-ended: 2M quad counts/sec.

Protection: Encoder error, not connected

Absolute encoders (optional): Up to four. EnDat 2.1(Digital)/2.2, Panasonic, Smart-Abs, BiSS-A/B/C, and SSI

Hall inputs: Four, a set of three per axis.

Type: single-ended, 5V, source, opto-isolated
 Input current: <7mA

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

Total current provided by the internal supply: 0.5A. If more current is needed, an external supply should be used, using the dedicated connector

Digital I/O

Axis' Limit inputs: Eight, Two per axis.

Type: Single-ended, 5/24V±20%,opto isolated, sink/source. 4-14mA per input

Unused limit inputs can be used as general purpose inputs

STO: Two inputs. Current per input <50mA

All drives are disabled within 50mS to 200mS

Registration MARK (High Speed Position Capture)

Inputs: Four, 24V±20%, opto-isolated, two terminals. Can be configured as 'sink' or 'source'. Input current 4-14mA. Can be used as general purpose inputs.

Motor Brake Outputs: Four, opto-isolated, source, 24V±20%, 0.5A. Can be used as general purpose outputs.

Ordering Options

Ordering options	Field	Example	Values
Number of axes	1	2	2,4
Continuous Current (Peak is double)	2	B	2x5A (A), 2x10A (B), 2x20A (C), 4x2.5A (J), 4x5A (D), 4x10A (E), 4x20A (F), 2x5A & 2x10A (G), 2x5A & 2x20A (H), 2x10A & 2x20A (I)
Total number of digital incremental encoders	3	4	2, 4. For 4-axis unit select 4
Absolute encoders type	4	N	U- All, None, Digital EnDAT 2.2(E), Smart Abs(S), Panasonic(P), BiSS-A/B/C (B), SSI (I)
Number of Absolute encoders interface	5	0	0,1,2,3,4
STO	6	Y	Yes (Y), No (N)
I/O configurations	7	N	(N) Inputs & limits: 24V,SOURCE (PNP), Outputs : 24V,SOURCE (PNP). (S) Inputs & limits: 24V,SINK (NPN). Outputs: 24V,SOURCE (PNP). (A) Inputs & limits: 5V/SOURCE (PNP). Outputs: 24V/SOURCE (PNP). (B) Inputs & limits: 5V/SINK (NPN). Outputs: 24V/SOURCE (PNP)
5V feedback supply	8	A	Internal (A), External (B)

Example: UDM_{MC}2B4N0YNA

Field	1	2	3	4	5	6	7	8	
PN	UDM _{MC}	2	B	4	N	0	Y	N	A

Position Event Generator (PEG): One, RS422.

Can be used as general purpose output. Pulse width 26nSec to 1.75mSec. Maximum rate: 10MHz

Drive Protection

- Over & under Voltage
- Short circuit: Phase-to-phase, Short to ground
- Over current
- Over temperature

Environment

Operation: 0 to +50°C

Storage and transportation: -25 to +60°C

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

Communication

Two EtherCAT ports, In and Out, RJ45 connector

Dimensions

152x138x48 mm³

Weight

1,000 [gram]

Accessories

UDM_{MC}-ACC1: Mating connectors kit for drives, encoders and I/Os

UDM_{MC}&NPX_{pm}-ACC2: (J1) mating 2m flying lead cable

STO-ACC1: Cable for STO with mating connector