

UDM_{NT}



EtherCAT[®] Dual & Single Axis Drive Module

Servo Performance:

- 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™ algorithm that provides better, more consistent servo performance, insensitive to noise and large changes in the system.

Universal drive:

- 2 and 3 phase AC Servo / DC brushless with sinusoidal commutation
- DC Brush
- Voice coils
- Closed and open loop step motors

12Vdc to 80Vdc, up to 10A continuous and 20A peak current

Wide range of feedback interfaces:

- Digital incremental encoders
- Sin-Cos analog encoder interface, supporting laser encoders with speeds >5MHz (optional)
- Absolute encoders (optional)

Comprehensive I/O:

- 4 general-purpose / Registration Mark inputs (high-speed position-capture inputs)
- 2 general purpose / motor brake outputs (24V, 0.1A)
- 2 PEG (Position Event Generator) outputs (high-speed position-based outputs)
- 2 analog inputs, ±10V
- 1 analog output, ±10V

Small footprint: 144x112.5x38.5 mm³

The UDM_{NT} is a line of compact, panel-mounted EtherCAT modules with single / dual-axis universal drives for servo, stepper, and voice-coil motors with peak power of up to 1.3kW.

The UDM_{NT} 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 combination of a 5MHz laser encoder interface and the powerful ServoBoost™, MotionBoost™ and JitterBoost™ algorithms, demanding positioning systems can achieve ultimate performance levels, such as speeds above 1m/s, jitter less than 3nm, almost zero settling time, and uncompromised system robustness with minimal sensitivity to disturbances and changes. The UDM_{NT} is a slave that runs under any ACS EtherCAT masters. A comprehensive set of software support tools are provided for module configuration, setup and tuning.

CE, UL

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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

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.

Control Supply

Control supply input voltage: 24Vdc \pm 20%
 Maximum input power: 15W
 Max input current: 0.8A @ 24V

Motor Type

Single phase motors: DC Brush, Voice coil
 2 or 3 phase AC synchronous motor
 2,3 and 5 phase step motor. Always using high resolution microstepping control.

Feedback

Types: incremental digital encoders, optional Sin-Cos encoders

Incremental Digital Encoder:

One per axis, A&B,I; CLK/DIR,I
 Type: RS-422
 Max. rate: 50 million encoder counts/sec

Sin-Cos Analog Encoder (optional):

One per axis
 Type: 1Vptp, differential
 Programmable multiplication factor: x4 to x4096
 Maximum frequency: 500kHz or 5MHz
 Maximum acceleration with Sin-Cos encoder: 10^8 sine periods/second²

Absolute Encoder (optional):

Two, EnDat 2.1(digital)/2.2, Smart- Abs, Panasonic, BiSS-C

Hall inputs:

Two sets of three per axis
 Type: single-ended, 5V, source, opto-isolated
 Input current: <7mA

Digital I/O

The Digital I/O are powered by an 24Vdc (default), 5V optional external supply

Safety Inputs:

Left and right limit inputs per axis.
 Type: 24Vdc, single-ended, Sink or Source, opto-isolated
 Max. nput circuit current: 4.1mA

Digital Inputs:

General purpose inputs:
 Four, 24V, single-ended, source, opto-isolated
 Max. Input current: 4.1mA
 Mark: Four

Digital Outputs:

General purpose outputs:
 Two, 24V, single ended, sink or source (default), opto-isolated, 100mA per each output
 Note: see ordering options for other I/O configurations
 PEG: Two

Analog I/O

Analog Inputs:

Two Inputs, \pm 10V, differential, 12 bit resolution.

Analog Outputs:

One output, \pm 10V, differential, 10 bit resolution.

Drive Protection

- Over voltage
- Under Voltage
- Phase-to-phase short circuit
- Short to ground
- Over current
- Over temperature

Environment

Operating range: 0 to + 50°C

Storage and transportation range: -25 to +60°C

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

Communication

Two EtherCAT ports, In and Out, RJ45 connector

Specifications

Product (x-number of axes)	UDM _{NT} XA...	UDM _{NT} XB...	UDM _{NT} XC...
Number of axes	1 or 2		
Motor voltage input range [Vdc]	12 - 80		
Control voltage input [Vdc]	24 +/- 20%		
Phase current per axis Cont./Peak Sine amplitude [A]	2.5/5	5/10	10/20
Phase Current per axis Cont./Peak RMS [A]	1.8/3.6	3.6/7.2	7.2/14.4
Total output power Cont./Peak [W]	320/640	640/1280	640/2560
Peak current time [sec]	1		
Max. output voltage to motor [Vdc]	(Vin motor) x 92%		
Max. RMS input current @ 80Vdc [A]	4.3	8.2	8.6
Minimum load Inductance, at maximum motor voltage [mH]	0.050		
Maximum Heat dissipation per axis [W]	0.6	1.4	3.4
Weight [gram]	540		
Dimensions [mm ³]	144x38.5x112.5		
Standards	CE, UL		

Ordering Options

Ordering options	Field	Example	Values
Number of axes	1	2	1,2
Continuous Current (Peak is double)	2	B	A- 2.5/5A, B- 5/10A, C- 10/20A
Total number of encoder channels	3	2	1 (for single axis unit only), 2
500kHz Sin-Cos	4	0	0,1,2
5MHz Sin-Cos	5	1	0,1,2
Absolute encoders type	6	N	N- None, E- EnDat 2.1(digital)/2.2, S- Smart Abs, P- Panasonics, B- BiSS-C
Number of Absolute encoders interface	7	0	0,1,2
I/O configurations	8	N	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)

Example: UDM_{NT}2B201N0N

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

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