UDMPA

EtherCAT® Dual & Single Axis Module

Powerful and Smart EtherCAT Drive Module

- Two drives per module for gantry control
- Voltage: 12-60Vdc or 12-100Vdc
- Current: Up to 13.3A / 40A (cont./peak)

Uncompromised Speed and Resolution

- 2 Analog Sin-Cos 1Vptp encoders with frequency up to 500KHz
- Encoder multiplication of 4 to 4,096
- Automatic encoder offsets, gain compensation and error detection
- Dual feedback support
- Optional internal relays for dynamic braking (shorting motor phases)

Smart Motion Related I/O

- 4 encoder registration MARK inputs
- 2 Position Event Generator (PEG) outputs
- 2 motor brake / relay outputs
- 2 analog inputs, 12 bit resolution, ±10V or 0-10V
- 2 analog outputs, 10 bit resolution, ±10V
- Safe Torque Off (STO)

The UDMPAis a line of economical and compact PCB mounted EtherCAT drive modules.

The UDMPA is specifically designed to complement the highest performance NPMPM *NanoPWM*™ drives and address the needs for more economical drives. It has the same form factor as the NPMpc and same connectivity

The UDMPA is a slave that runs under any ACS EtherCAT master.

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

Specifications

Per Drive	A	B	C	D
Cont./peak output current Sine amplitude [A]	3.3/10	6.6/20	10/30	13.3/40
Cont./peak output current [Arms]	2.3/7	4.6/14.1	7/21.2	9.4/28.2
Maximum cont. input current [Arms]	2.6	5.3	8	10.6
Maximum cont./peak output power @ 60Vdc [W]	150/460	310/920	470/1380	610/1850
Maximum cont./peak output power @ 100Vdc [W]	260/780	520/1560	790/ 2340	1050/3120
Peak current time [sec]	1			
Minimum load inductance @100Vdc [mH] Can be derated linearly for lower voltages	0.05			
Per Module				
Control voltage input [Vdc]	24 ± 10%			
Drive voltage input range [Vdc]	12-60Vdc (56 recommended) 12-100Vdc (96 recommended)			
Max. drive output voltage [Vdc]	(Vin motor) x 92%			
Max. cont. input current [Arms]	5.2	10.6	16	21.2
Maximum heat dissipation @ 60Vdc [W] (i = no. of drives)	6 + 0.7 x i	6 + 1.7 x i	6 + 2.9 x i	6 + 4.1 x i
Maximum heat dissipation @ 100Vdc [W] (i = no. of drives)	6 + 0.9 x i	6 + 2.1 x i	6 + 3.7	6 + 5.6 x i

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. Initialization with or without Hall sensors.
Switching method: advanced unipolar PWM.
Built-in relays short motor phases upon disable (16A nominal, for dynamic braking)
Protection: Over and under voltage, Over current, Over-temperature, Phase to phase and phase to ground short (short circuit on one of the motor phases may damage the drive).

Supplies

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 and if STO, is used there is no need to disconnect the drive supply.
Drive Supply: Mating connector is not supplied.
Range: 12Vdc to 60Vdc or 12Vdc to 100Vdc,
Recommended range: 12-56Vdc for 60Vdc version, or 12-96dc for 100Vdc version.
Current rating should be calculated based on actual load.
If regeneration resistor is required, it should be added in parallel to drive supply, with activation at 62V for 60V version, or 102V for the 100V version.
Control Supply: Mating connector is supplied.
Range: 24Vdc ± 10%.
Maximum input current / power: 0.9A @ 21.6V/ 20W,
without motor brakes: 1.9A @ 21.6Vdc / 42W
Built-in motor phases shortening relays.
Protection: reverse polarity. A 3A external fuse must be 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

Types: Incremental digital encoders (AqB), Hall inputs, analog Sin-Cos (optional).
Incremental Digital Encoder: One per axis. A&B, I and Clk/Dir.
Type: Differential RS-422. Max. rate: 50M quad counts/sec.
Protection: reverse polarity. Use a 3A external fuse.
Sin-Cos Analog Encoder: One per axis
Type: 1Vptp, differential. Programmable multiplication factor: x4 to 4096.
Maximum frequency: 500kHz.
Maximum acceleration with Sin-Cos encoder: 10^8 sine periods/second^2.
Absolute Encoder (optional):Up to 2
In a single axis configuration, dual feedback consumes one network axis.
EnDat 2.2 / 2.1(digital only), Biss-A/B/C, SSI.
Hall inputs: A set of three per axis.
Type: single-ended, 5V, source, open cathode. Input current: <7mA.
Feedback supplies: For all digital feedback devices: 5V, 0.5A.
For all analog feedback devices: 5V, 1.5A (AGND).
It is recommended to include a dedicated supply on the carrier board.

Digital I/O

For different I/O configurations see ordering options.
Safety Inputs: Left & right limit inputs per axis.
Type: 24V/ Source (default), single ended, opto-isolated. Input current 4-14mA.
STO: Two inputs, 24V ±20%. Input current: <50mA
All drives are disabled within 200mS
Registration Mark Inputs: (High Speed Position Capture): Four, 24V ±20% opto-isolated, two terminals. Input current 4-14mA.
Can be used as general purpose inputs.
General Purpose Output: Motor Mechanical Brake output: Two, 5/24V ±20%. opto-isolates, single-ended, sink/source, 0.1A.
Exteranal Motor Relay Control: Two 24V ±20%, source, 0.5A.
These outputs are used to shorten the phases of the motors by external relays (if the optional internal relays are not present).
PEG (Position Event Generator): Two, Pulse or State, Differential, RS422.
Pulse width: 26nSec to 1.75mSec. Maximum rate: 10MHz.
Can be used as general purpose output.

Analog I/O

Analog Inputs: Two, ±10V, differential, 12 bit resolution.
Max. input frequency: 1 kHz. Offset: <100mV.
Analog Outputs: Two, ±10V, differential, 10 bit resolution.
Offset: ±100mV, Bandwidth: 5 kHz. Max. output load: 10KΩ, Noise/Ripple: <25mV.

EtherCAT Communication

Two ports, In and Out, RJ45 connector

Environment

Operating range: 0 to +40°C.
Storage and transportation range: -25 to +60°C.
Humidity (operating range): 5% to 90% non-condensing.

Dimensions

257 x 154.9 x 50.9 mm^3.

Weight

1.6 kg

Accessories

UDMpa-ACC1: Mating Connector Kit
UDMpa-ACC2: UDMpa (J1) mating 2m flying lead cable
STO-ACC1: 2 meter cable with flying leads

Certification

CE: Yes
Safety: IEC 61800-5-1
EMC: EN 61800-3
UL Certification: UL 61800-5-1
Functional Safety: IEC 61800-5-1, IEC 61800-5-2

Ordering Options

Ordering Options	Field	Example User Selection	Values
Number of axes/drives	1	2	1, 2
Current	2	A	A - 3.3/10A B - 6.6/20A C - 10/30A D - 13.3/40A
Maximum voltage	3	B	A - 60V B - 100V
500kHz SIN-COS encoder interface	4	0	0, 1, 2
Absolute encoders type	5	N	N - None, U- User selectable E- EnDat 2.2/ 2.1 (digital only), B - Biss-A/B/C, I - SSI
Number of Absolute encoders interface	6	0	0, 1, 2
Limit switches	7	D	A - 5V, Source/PNP B - 5V, Sink/NPN C - 24V, Source/PNP D - 24V, Sink/NPN7
Digital Inputs	8	A	A - 5V, Two-terminal B - 24V, Two-terminal
Digital Outputs	9	B	A - Source/PNP, 5V & 24V B - Sink/NPN, 5V & 24V
Special options	10	N	N - None
STO	11	N	Y - Yes, N - No
Motor relays	12	N	Y - Yes, N - No

Example: UDMpa2AB0N0DABNNN

Field		1	2	3	4	5	6	7	8	9	10	11	12
PN	UDMpa	2	A	B	0	N	0	D	A	B	N	N	N