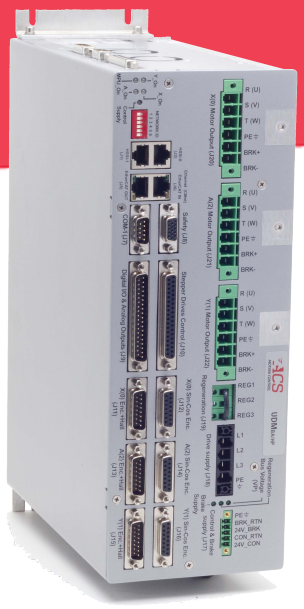
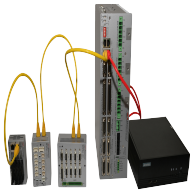
UDMHP/BA



EtherCAT® Drive Module with Three Built-in Drives

- EtherCAT Universal Drive Modules with up to 3 built-in drives
- Two versions: Economical (BA) and High Performance (HP)
- Three built-in drives
  - 85 to 265Vac, up to 15A continuous and 30A peak current
  - 4 encoders
  - 20kHz sampling and update rate of all control loops
- Digital I/O
  - 8/8 general purpose inputs / outputs
  - 4 Registration MARK inputs, 2/8 PEG outputs
  - (Pulse/States)
  - 3 motor brake outputs 24V/1A
- Alog I/O: 8/2

The UDMHP/BA is a state of the art series of EtherCAT drive modules with three built-in universal drives. It addresses the needs of modern machinery for both economical and for high performance, scalable and distributed control for motion centric applications.



The UDMHP/BA operates as an EtherCAT node under any SPiiPlus EtherCAT master Controller including the PC based SPiiPlusSC Soft Controller.

The UDMHP/BA addresses high accuracy demanding applications, while the UDMHP/BA econo version addresses more price sensitive applications. The UDMHP/BA are complemented by the SPiiPlusNT suite of software tools that minimizes network configuration and drive set up efforts and time to market. The built-in drives are offered with three current levels: 5/10A, 10/20A and 15/30A (cont./peak).

The modules are powered by a single or three-phase AC from 24 to 265Vac (rectified internally to generate a Vac x 1.4 motor voltage) and by a separate 24Vdc control supply that keeps all low voltage signals alive during emergency conditions. It supports a wide range of position feedback devices: incremental digital, analog Sin-Cos, and absolute encoders.

ACS MOTION CONTROL

Specifications

Product (xx - HP or BA) (y - number of Axes)	UDMxxyA...	UDMxxyB...	UDMxxyC...
Number of built-in drives	1, 2, 3		
Motor voltage AC input [Vac]	85 - 265, single and 3 phase		
Control voltage input [Vdc]	24 ± 10%		
Phase current Cont./Peak Sine amplitude [A]	5/10	10/20	15/30
Phase current Cont./Peak RMS [A]	3.6/7.1	7/14	10.6/21.2
Peak current time [sec]	1		
Max. output voltage [Vdc]	(Vac in) x1.41 x 97%		
Max. RMS input current 1-phase supply [A]	18	18	24
3-phase supply[A]	13	18	24
Min. load Inductance, at max. motor voltage [mH]	1		
Max. Heat dissipation per axis [W]	30	48	79
Weight [gram]	5750		
Dimensions [mm^3]	324x249x120		
Standards	CE, UL (Pending)		

Note: For cooling use fan with airflow of 25CFM

Ordering Options

Ordering Options	Field	Example User Selection	Values
Type, Basic or High Performance	1	ba	ba-economical, hp-high performance
Number of built-in drives (85Vac - 265Vac)	2	3	1, 2, 3
Continuous Current (Cont/Peak)	3	C	A - 5/10A,B - 10/20A,C - 15/30A
Number of 250kHz SIN-COS encoder interface	4	0	0, 1, 2, 3
Total number of feedback channels	5	4	4
Absolute encoders type	P	P	N - None,U - User selectable, E - EnDAT 2.2 & 2.1 digital only, S - Smart Abs, P - Panasonic, B - BiSS-A/B/C,I - SSI.
Number of Absolute encoders interface	7	3	0, 1, 2, 3
STO	8	N	N - No
EtherCAT Master	9	1	1 - Any ACS EtherCAT master
Low Voltage (17Vdc-85Vdc) operation	10	Y	Y - Yes, N -No

Example: UDMba3C04P3N1Y

Field		1	2	3	4	5	6	7	8	9	10
PN	UDM	ba	3	C	0	4	P	3	N	1	Y

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

Optional _ algorithm that provides better, more consistent servo performance, insensitive to noise and large changes in the system (hp version only).

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, motor over temperature
Current sensing: CMba: 12b ADC, CMhp: 16b ADC

Power Supplies

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

Motor Supply: Range: 85 to 265Vac Optional Low Voltage operation (17-85 Vac or 24-120 Vdc)
Control Supply: 24Vdc ± 10%, 4A
Motor Brake Supply: 24Vdc ± 20%, 3A

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, AC induction*.
* Consult ACS.

Feedback

Incremental Digital Encoder: Four, 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): Three.1Vptp, differential.
Multiplication factor: From x4, to-BA: x4,096 HP-x65,536
Maximum frequency: 250kHz
Automatic compensation of Offset, Phase and Amplitude
ADC used: UDMBA: 12b, UDMHP: 16b low S/N
Maximum acceleration: 108 million sine periods/sec^2.
Protection: Encoder error, not connected.
Hall inputs: Three sets of three per axis.
Single-ended, 5V, source, opto-isolated.
Input current: <7mA.
Absolute encoders (optional): Three, EnDat 2.1 (Digital)/2.2, Smart-ABS, Panasonic, Biss-A/B/C, SSI.
5V feedback supply: Total current available for feedback devices: 1A

Digital I/O

Safety Inputs: Left + right limit per axis, E-stop, General Purpose Inputs: 8 Single-ended, 5Vdc (±10%) or 24Vdc (±20%), opto-isolated, sink/source, Input current: 4-14mA
Registration Mark inputs: Four. RS422
Motor Brake Outputs: Three. 24V, 1A,optoisolated. Powered by the 24V Brake Supply.
General Purpose Outputs: Eight. Single-ended, 5Vdc (±10%) or 24Vdc (±20%), opto-isolated, sink/source, 100mA
Position Event Generator outputs (PEG): Two PEG_Pulse and eight PEG_State, RS422 Can be used as general purpose outputs.
HSSI channels: Two. RS422

Analog I/O

Inputs: Six ±10V, differential, 20kHz sampling rate. The inputs can be used as feedback to the servo loops. Resolution: CMba - 12b, CMhp - 16b. Joystick inputs: two single-end, ±10V, 12b resolution
Outputs: Two, Single-end, ±10 V ±5%, 10 bit resolution

Communication

EtherCAT: Two, In & Out, 100 Mbit/sec, RJ45 connectors

Environment

Operating: 0 to +40°C. Storage : -25 to +60°C Humidity: 5% to 90% non-condensing

Certifications

CE: Yes
Electrical Safety: EN 60204
EMC: EN 61326-1
UL Certification: 5/10A and 10/20A only (CSA Certification) CSA standard C22.2 No 0, CSA standard C22.2 No 14, ANSI/UL508C
Functional Safety: IEC 61800-5-1, IEC 61800-5-2 Pending