SPiiPlusCM_{HP/BA}

32 Axis EtherCAT[®] Master Control Module with Three Built-in Drives

- > Up to 32 axes and thousands of I/O
- Open Architecture Command ACS and third party EtherCAT drives and I/O
- > Plug-in replacement for the series of SPiiPlusCM Control Modules
- > Two versions: Economical (ba) and High Performance (hp)
- > Analog I/0: 8/2
- > Optional built-in 4-axis Pulse/Dir interface and Laser control

- > Three built-in drives
 - > Up to 265Vac, 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

The SPiiPlusCMHP/BA is a state of the art series of EtherCAT motion controllers 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. Its open architecture operates in conjunction with ACS' line of EtherCAT servo and step motor drives and I/Os modules, as well as with any certified EtherCAT module that complies with CAN over EtherCAT (CoE) protocol, providing a comprehensive and cost effective control solution for demanding machinery.

The SPiiPlusCMHP/BA controls and generates the motion profile for up to 32 axes.

The SPiiPlusCMHP addresses high accuracy demanding applications, while the SPiiPlusCMBA econo version addresses more price sensitive applications. The SPiiPlusCMHP/BA are complemented by the SPiiPlusNT suite of software tools with built-in simulator that minimizes development effort and time to market. It provides extraordinarily easy setup, fast host and embedded application development, and quick diagnostics, reducing efforts and costs. 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 of up 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.

The modules are optionally available with built-in additional 4-axis control of drives with Pulse/Dir (P/D option) and Laser control interface (LC1 option).





Specifications

Product			
(xx - BA or HP)	CMxxyA	CMxxyB	CMxxyC
(y - number of axes)			
Number of built-in drives		1,2,3	
Motor voltage AC input [Vac]	85 - 26	55, single and 3	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]	(Va	ac in) x1.41 x 9	7%
Max. RMS input current 1-phase supply [A] 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)

Example:CMBA3B24E21A1AWNANYY



Ordering Options im p Field User electior ba-economical, hp-high performance Type Number of built-in drives 1.2.3 (85Vac-265Vac) Current rating of built-in drives A- 5/10A, B- 10/20A, C- 15/30A (cont/peak) Sin-Cos encoder interface 0,1,2,3 Tot. no. of feedback channels 4 U- All, N- None, E- EnDAT 2.1(digital)/2.2, S-Absolute encoders type Smart Abs, P- Panasonic, B- Biss-A/B/C, I- SSI Numb interfa XL SCA

Number of Absolute encoders interface	7	2	0,1,2,3	
XL SCAN (unit per scanner)	8	1	N- Non, 1,2,,10(A), 11(B),12(C),13(D),14(E),15 (F),16(G)	
Maximum number of axes	9	А	4 (included automatically FOC), 8, 16-A, B- 32	
3rd party EtherCAT servo drives	10	1	Up to the maximum number of axes (FOC) - number of internal drives	
3rd party EtherCAT Step motor Drives)	11	А	Up to the maximum number of axes (FOC) - number of internal drives	
ECAT 3rd party IO EtherCAT nodes	12	w	W- 32 (included automatically FOC), X- 64	
G-Code, Flexible configuration, Both	13	N	N- None, G- G-code, F- Flexible configuration, T- Both	
<i>ServoBoost</i> ™number of axes supported (HPversion only)	14	A	N- 0, A- 4, B- 8, C- 12, D- 16, E- 20, F- 24, G- 28, H- 32	
Input shaping	15	N	Y- Yes, N- No	
Pulse-Dir for 4 axes or LC1 option installed	16	Y	N- No, Y- P/D, L- LC1	
Low Voltage operation (17- 85Vac or 24-120Vdc)	17	Y	Y- Yes, N- No	

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 ServoBoost™algorithm (CMhp 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

Motor Supply Range: 85 to 265Vac, for 15/30A (cont./Peak) current model: 130 to 265Vac (Optional - Low Voltage 17-85Vac or 24-120Vdc) 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 (microstepping open or closed loop, loop)

Feedback

Incremental Digital Encoder: Four, A&B,I; Clk/Dir, IRS-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-CMBA-x4,096, CMHP-x65,536

Maximum frequency: 250kHz

Automatic compensation of Offset, Phase and Amplitude ADC used: CMBA: 12b, CMHP: 16b low S/N Maximum acceleration: 108 million sine periods/sec2. 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): EnDat2.1(Digital)/2.2,

Tamagawa Smart-Abs, Panasonic, BiSS-A/B/C, SSI 5V feedback supply: Total current available for feedback devices: 1A

Pulse/Direction Interface (Optional)

Four pairs.

Type: RS-422. Up to 5 million pulse/sec. Programmable pulse width Range: 0.08 to 80 microseconds

Laser Interface (Optional)

Pulse differential output, RS422 Fault input, Opto-isolated, 2-terminal Enable output, Opto-isolate, 2-terminal Pulse frequency: 9Hz to 1.181Mhz Pulse width: 6.67ns to 111ms Duty cycle: 0 to 100%

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, ±10V, 10b resolution

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 ,opto-isolated. Powered by the 24V Brake Supply General Purpose Outputs: Eight. Single-ended, 5Vdc (±10%) or 24Vdc (±20%), opto-isolated, sink/source, Max. output current per output: 100mA, Max. total of 800 mA for all Position Event Generator outputs (PEG) Two PEG_Pulse and eight PEG_State, RS422 Can be used as GP outputs HSSI channels: Two. RS422

Communication Channels

Serial ports: one RS-232. One RS-232/422. Ethernet: TCP/IP 10/100Mbits/sec (10/100 BaseT) EtherCAT: Two, In & Out, 100 Mbit/sec, CoE and FoE protocols support

Motion Processor Unit (MPU)

Processor Type: Multi-core Intel Atom CPU (model depends on controller configuration) EtherCAT Cycle Rate: 2kHz (contact ACS for higher rate options) RAM: 1GB Flash: 2GB

Certifications

CE: Yes Electrical Safety: EN 60204 EMC: EN 61326-1 UL: 5/10A and 10/20A only (CSA Certification) CSA standard C22.2 No 0, CSA standard C22.2 No 14, ANSI/UL5080

Environment

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

