

SPiiPlusCMnt-2-320

32 Axis EtherCAT Master Control Module with Two Built-in Drives



- **Integrated EtherCAT master with two built-in drives**
 - Up to 32 axes and thousands of I/O
 - Open Architecture – Command ACS and third party EtherCAT drives and I/O
- **A rich set of tools for application development, set up, tuning and diagnostics**
- **Powerful ACSPL+ multitasking motion and IEC-61131-3 PLC programming languages**
- **All capabilities and features of the field proven SPiiPlus line of high performance control modules**
- **Two built-in drives**
 - 85 to 265Vac, up to 7.5A continuous and 15A peak current (~1.6kW/3.2kW @230Vac)
 - Dual feedback per axis
 - 20kHz sampling and update rate of all control loops
 - Safe Torque Off (STO)
- **Digital I/O: 8 + 8**
- **Analog I/O: 4 + 2, 12 bit resolution**

The SPiiPlusCMnt-2-320 is a state of the art line of EtherCAT network multi-axis machine and motion controllers with two built-in universal drives. It is specifically designed to extend the capabilities of the SPiiPlus line of control modules to address the needs of modern machinery for an economical 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 SPiiPlusCMnt controls and generates the motion profile for up to 32 axes. The EtherCAT network scanning rate is up to 2kHz. All drives are highly synchronized by a distributed clock with accuracy better than 0.1 microsecond, and execute the control algorithms at a 20kHz rate. The SPiiPlusCMnt is complemented by the SPiiPlus suite of software tools with built-in simulator. The tools are designed to minimize time to market while providing the flexibility to meet the specific machine requirements throughout its life cycle. It provides extraordinarily easy setup, fast host and embedded application development, and quick diagnostics, reducing efforts and costs. The SPiiPlusCMnt-2-320 is offered with two current levels: 5A/10A (cont./peak) and 7.5A/15A. Optional Safe Torque Off (STO) module cuts the power to the motor without removal of the power source to comply with SIL-3 and PLe safety levels. The module is powered by a single phase 85 to 230Vac and by a separate 24Vdc control supply that keeps all low voltage signals alive during emergency conditions.

CE, UL

Specifications

Part Number Where X represents number of axes and XX represents special options	SPiiPlus CMnt X-320- 005-XX	SPiiPlus CMnt X-320- 007-XX
Number of Axes	1 or 2	
Input voltage range [Vac]	85 to 265	
Phase Current Cont./Peak, sine amplitude [A]	5 / 10	7.5 / 15
Phase Current Cont./Peak, RMS [A]	3.6 / 7.1	5.4 / 10.8
Peak current time [sec]	1	
Max. output voltage	Vdc x 1.4	
Max. Input cont. power per axis @ 230Vac [kVA]	1.6	2.5
Max. output power (Cont./Peak) per axis @ 230Vac [kW]	1.1/2.2	1.6/3.2
Minimum load Inductance, at maximum motor voltage [mH] With a lower voltage the minimum inductance value can be reduced proportionally.	0.05	
Max. Heat dissipation per axis @ 230Vac [W]	50	75
Weight without / with additional heat sink [gram]	2,000 / 2,750	
Dimensions without / with additional heat sink [mm]	270 x 157 x 67 / 270 x 157 x 78	
Standards	CE, UL (pending)	

Note: Cooling by forced airflow is required. For maximum power at elevated temperature the additional heat sink option is required. See manual.

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

Supply

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

Motor Supply

Range: 85 to 265Vac
Current rating should be calculated based on actual load.

Control supply

Range: 24Vdc ± 10% Maximum input current / power: 4A / 100W
Note: The module consumes 2A (50W). Additional 2A are needed when the motor brake feature is used

Motor Type

3 and 2 phase AC synchronous, AC Induction and DC brush motors

Feedback

Incremental Digital Encoder: Four, two per axis, 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): Two, one per axis. 1Vptp, differential.
Multiplication factor: 4x to 16,384x. Usable: x4,096. Maximum frequency: 250kHz
Automatic compensation of Offset, Phase and Amplitude
Maximum acceleration: 10⁸ million sine periods/sec². Protection: Encoder error, not connected
Hall inputs: Two sets of three per axis. Single-ended, 5V, source, opto-isolated.
Input current: <7mA.
Resolver: 12b resolution (4,096 counts/rev)
Absolute encoders (optional): EnDat 2.2, Smart-Abs, Panasonic, BiSS-C, Hiperface.
Consult ACS for availability
5V feedback supply: Total current available for feedback devices: 250mA.

Digital I/O

Safety Inputs: Left + right limit per axis. Single-ended, 24V±20%, opto_isolated, source. (Consult ACS for 5V & sink)
Input current: 14mA. E-Stop: Opto-isolated, floating two-terminal.
Motor Brake outputs: Two. 24V, 1A ,opt_isolated. Powered by the 24V Control Supply.
STO: Two pairs of inputs. (Optional)
General Purpose Inputs: Eight, Single-ended, 24V±20%, opto-isolated, source. (Consult ACS for 5V and sink)
Input current: 14mA.
Registration Mark: Four. Two are RS422 with dedicated inputs and can be used as GP inputs. Two share General Purpose Inputs 6,7.
General Purpose Outputs: Eight. Single-ended, 24V±20%, opto-isolated, source. 0.5A per output with up to 3A for all outputs.
Position Compare Outputs (PEG): Two PEG_Pulse and two PEG_State, RS422. Flexible axis assignment. Can be used as GP outputs.
Two GP opto-isolated outputs can be programmed to be used as the PEG Pulse outputs.
Pulse width with RS422 outputs: 26nSec to 1.75mSec. Maximum rate with RS422 outputs: 10MHz.
Pulse width with GP outputs: 0.75mSec to 1.75mSec. Maximum rate with GP outputs: 1kHz
HSSI: One channel. RS422.

Analog I/O

Four inputs, Two outputs, ±10V, differential, 12 bit resolution. 20kHz sampling rate. The inputs can be used as feedback to the servo loops.

Controller and EtherCAT Master

Number of axes: Up to 32
MPU/EtherCAT Cycle Rate: 2kHz (2,4,6,8,16 axes), 1kHz (32 axes)
Communication Channels
Ethernet: one, TCP/IP, 10/100 Mbits/sec.
Serial: One RS-232. Up to 115,200bps. Modbus protocol as master or slave.
EtherCAT: Two, In & Out, 100 Mbit/sec, CoE and FoE protocols.
MPU
User Memory: RAM: 128Mb.
Non-volatile memory (Flash): 128Mb.
Power up Time: 25sec.

Environment

Operating: 0 to + 50°C. Storage : -25 to +70°C. Humidity: 5% to 90% non-condensing

Ordering Information	Field	Example	Values
Number of built-in drives (85Vac-265Vac)	1	2	1,2
Current rating of built-in drives (cont/peak)	2	5/10A	5/10A, 7.5/15A
SIN-COS encoder interface	3	0	0,1,2
Digital incremental encoders per axis ¹	4	2	1,2
Absolute encoders type	5	None	E - EnDat 2.2, S - Smart-Abs, P - Panasonic, B - BiSS-C, H - Hiperface. Consult ACS
Number of Absolute encoders interface	6	0	0,1,2
STO	7	No	Yes, No
Maximum number of axes	8	16	2,4,8,16,32
ECAT 3rd party Servo Drive	0	9	0 to 30
ECAT 3rd party Step motor Drive (open & closed loop)	10	0	0 to 30
ECAT 3rd party IO EtherCAT node	11	0	0 to 99
PLC (IEC-61131-3)	12	No	Y-Yes, N-No
ServoBoost, number of axes supported	13	0	0,4,8,12...32
Input shaping	14	No	Y-Yes, N-No
Additional heatsink installed	15	No	Y-Yes, N-No

Example: CMnt2502N0N16000NNNN

Field		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
PN	CMnt	2	5	0	2	N	0	N	16	0	0	0	N	N	N	N

(1) The unit can be provided with one or two digital incremental encoder interfaces per axis. For example, if dual loop is needed, then it should be ordered with two encoders per axis. The number of network axes occupied is equal to the number of digital incremental encoders.