SPiiPlusEC

Powerful Motion Controller and EtherCAT® Network Manager

- Up to 64 fully synchronized axes
- Up to 5KHz rate of profile generation and EthercAT cycle
- *NetworkBoost™* network failure detection and recovery with ring topology
- Up to 1GbE Ethernet host communication
- Open Architecture - ACS' and other vendor's EtherCAT devices, drives and I/O
- Comprehensive set of support tools for EtherCAT Network setup, axis tuning, application development, and diagnostics

ACS' SPiiPlusEC is a state of the art line of Motion controllers and EtherCAT master.

It is specifically designed to extend the capabilities of the SPiiPlus line of controllers and etherCAT master, to address the needs of modern machinery for cost effective high performance multi-axis, scalable and distributed control of motion centric applications. The SPiiPlusEC 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 third party EtherCAT module that complies with CAN over EtherCAT (CoE) protocol. The unique ***NetworkBoost***™ optional feature increases machines' uptime using ring topology based redundancy to continue operation upon a network failure.

The SPiiPlusEC EtherCAT cycle and profile generation rate is 1 to 5kHz. ACS drives execute the servo control algorithms at a 20kHz rate using a distributed clock to ensure synchronization of better than 0.1 microsecond between all axes.

The SPiiPlusEC is complemented by the SPiiPlusNT suite of software tools that are designed to minimize time to market and to address the specific machine requirements throughout its whole life cycle. It provides extraordinarily easy automatic network setup, fast host and embedded application development, and quick diagnostics. Set up of third party drives are done using by the third party tuning tools. Once connected to the EtherCAT network, real time variables, such as position, position error, velocity and others can be viewed, monitored and recorded with ACS' tools. All tools include a built-in simulator, powerful remote access and diagnostics, and fast error recovery, reducing training effort and costs.

CE *Pending*

Specifications

Number of Axes
Up to 64 axes, Thousands of I/O's

Motion Types
- Multi-axis point-to-point, jog, tracking and sequential multi-point motion
- Multi-axis segmented motion with look-ahead
- Arbitrary path with PVT cubic interpolation
- Third order profiles (S-curve)
- Smooth on-the-fly change of target position or velocity
- Inverse/Forward kinematics and coordinate transformations (at application level)
- Master-slave with position and velocity locking (electronic gear/cam)

Programing
- ACSPL+ powerful motion language
  - Real-time program(s) execution
  - Up to 64 simultaneously running programs
- NC programs (G-code)
- C/C++, .NET and many others standard languages

Supported EtherCAT Modules
All ACS EtherCAT network modules. Refer to ACS web site for an updated list of modules www.acsmotioncontrol.com/products.
Non ACS Modules
ACS qualifies drives and I/O modules made by other vendors
Refer to ACS web site for an updated list of other vendor's supported modules www.acsmotioncontrol.com/downloads
Other vendor's drives supported mode is Cyclic Synchronous Position (CSP). Additional modes are supported by some drives. Contact ACS for details: sales@acsmotioncontrol.com

Communication Channels
Serial: two RS-232. Up to 115,200 bps
Ethernet: One, TCP/IP, 100/1000 Mbs
Simultaneous communication through all channels is fully supported.
Modbus as master or slave is supported over Ethernet and serial channels.
Ethernet/IP protocol as adapter is supported over Ethernet channel.

EtherCAT ports
Two ports, Primary and secondary
Rate: 100 Mbit/sec
Protocols: CoE and FoE
NetworkBoost™ (optional) - Automatic network failure detection and recovery using ring topology and redundancyring topology and redundancy

MPU
Processor: Intel® Atom™ N2600 1.6 GHz
Memory: RAM- 1GB, Flash NV memory- 512MB

Product	Maximum Number of Axes	ACSPL+ Buffers/ tasks	Controller Cycle Time (msec)				
			1	0.5	0.25	0.2	Default Value
SPiiPlus EC-02-...	2	10	√[1,2]	√[1,2]	√[1,2]	√[1,2]	0.5
SPiiPlus EC-04-...	4	10	√[1,2]	√[1,2]	√[1,2]	√[1,2]	0.5
SPiiPlus EC-08-...	8	10	√[1,2]	√[1,2]	√[1,2]	√[2,3]	0.5
SPiiPlus EC-16-...	16	16	√[1,2]	√[1,2]	√[2,3]	-	0.5
SPiiPlus EC-32-...	32	32	√[1,2]	√[1,2]	-	-	0.5
SPiiPlus EC-64-...	64	64	√[1,2]	-	-	-	1

1- Extended Segmented Motion (XSEG) with no limitations.
User should check that USAGE < 80%.

2- *NetworkBoost*™ limitations: CTIME = 1 msec - up to 64 axes.
CTIME = 0.50 msec - up to 24 axes . CTIME = 0.25 msec - up to 8 axes.
CTIME = 0.20 msec - up to 4 axes

3- Extended Segmented Motion (XSEG) with limitations:
Segment length > 5 ms. IMM VEL = ... command shouldn't be used

Power Supply
24Vdc ± 10%, 0.8A

Environment
Operating Temperature: 0°C to 55°C
An internal fan is automatically activated when operating temperature rises above 30°C
Storage Temperature: -20°C to 85°C
Humidity: 90%RH, non-condensing

Dimensions
158 x 124 x 45 mm^3

Weight
450 gr.

Accessories
Din rail mounting kit (DINM-13-ACC) included with product

Ordering Options

	Field	Example selection by user	Optional Values
Maximum number of axes	1	04	2,4,8,16,32,64
ECAT 3rd party Servo Drive	2	00	Up to the maximum number of axes
ECAT 3rd party Step motor Drive (open & closed loop)	3	00	Up to the maximum number of axes
ECAT 3rd party IO EtherCAT node	4	04	4 (included automatically FOC), 8,16,32,64
G-Code	5	N	None (N), G-code (G)
ServoBoost™, number of axes supported	6	A	0(N), 4(A), 8(B), 12(C), 60(P), 64(Q)
Input shaping	7	Y	Yes (Y), No (N)
Maximum MPU cycle rate (kHz)	8	D	Default (D), 4kHz (4), 5kHz (5)
NetworkBoost™ - Ring topology, cable failure detection & recovery	9	N	None (N), NetworkBoost (A)
Number of ACSPL+ buffers/tasks	10	D	Default* (D), 16 (A), 32(B), 64(C)
For future use	11	N	Not used (N)
For future use	12	N	Not used (N)

Example: SP+EC04000004N04YDNDNN

Field		1	2	3	4	5	6	7	8	9	10	11	12
PN	**SP+EC**	04	00	00	04	N	A	Y	D	N	D	N	N

* Default number of ACSPL+ buffers/tasks is a function of the number of axes specified (field 1).
Up to 8 axes - 10 buffers; 16 axes - 16 buffers; 32 axes - 32 buffers; 64 axes - 64 buffers

ACS MOTION CONTROL