

SPiiPlusES

High Performance Multi-Axis EtherCAT® Controller & DS402 Multi-Axis EtherCAT® Drive Node

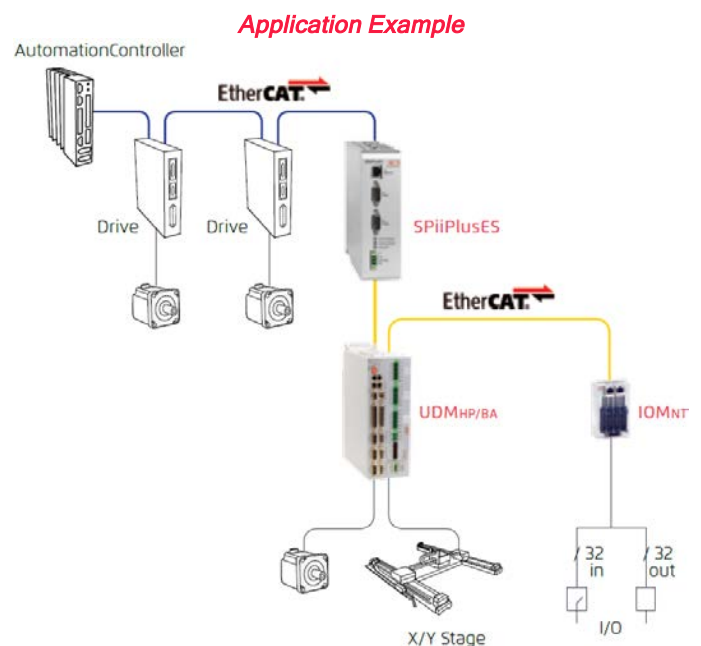


SPiiPlusES as a DS402 Multi-Axis EtherCAT Drive Node

- > Can be managed by any EtherCAT Automation Controller
- > Up to 8 axes utilizing standard DS402 CoE drive commands
- > Up to 64 axes utilizing manufacturer's specific CoE drive commands
- > Distributed clock
- > Up to 5kHz EtherCAT cycle rate

SPiiPlusES as an EtherCAT Master

- > Identical to SPiiPlusEC, powerful EtherCAT Motion Controller
- > Up to 64 axes and many I/Os
- > Up to 5kHz EtherCAT cycle rates
- > **NetworkBoost™** for cable failure detection and recovery
- > Can be synchronized to the distributed clock of the external network



The SPiiPlusES is a high performance programmable motion controller and EtherCAT Master that can be connected as a node to any EtherCAT network utilizing the standard DS402 CAN Over EtherCAT (CoE) protocol. To the external EtherCAT Master it looks like a highly programmable multi-Axis motor drive.

The SPiiPlusES expands the capability of any EtherCAT Automation Controller to manage up to 64 axes and thousands of I/O utilizing ACS EtherCAT sub-network. With up to 8 drives/axes, standard DS402 commands are used. For additional drives/axes, up to 64, DS402 manufacturer's specific commands are used. It supports distributed clock and the ability to synchronize the two EtherCAT networks. Any application in the fields of Semiconductors, Laser micro-machining, Electronics manufacturing, digital printing and more, that uses an EtherCAT automation controller will benefit from the unique and advanced capabilities of ACS programmable motion controller and wide range of drives to enhanced accuracy and throughput.

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Specifications

Number of Axes

As a Master: Up to 64 axes

As a Slave: 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)

Programming

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

Working Under SPiiPlusES EtherCAT Master

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

Motion Processor Unit (MPU)

Processor Type: Multi-core Intel Atom CPU (model depends on controller configuration)

Quad-Core supplied to controllers with an MPU cycle rate of 4 to 5 kHz or 64 Axes.

Dual-Core is provided for all other configurations.

RAM: 1GB

Flash: 2GB

Field Upgrades

For controllers ordered from the factory with Maximum Number of Axes equal to 32 or less and Maximum MPU Cycle Rate of 2kHz (default), the following field upgrade options are available:

Maximum Number of Axes	Maximum MPU Cycle (kHz)
2	4, 5
4	4, 5
8	4, 5
16	4, 5 ¹
32	2

¹16 axes and 5 kHz (requires Dual EtherCAT Network option)

It is not possible to field upgrade a controller ordered with 32 axes or less to 64 axes.

For controllers ordered from the factory with Maximum Number of Axes equal to 64 and Maximum MPU Cycle Rate of 1kHz (default), the following field upgrade options are available:

Maximum Number of Axes	Maximum MPU Cycle (kHz)
64	2

MPU/EtherCAT Cycle Rate

The following options are available for MPU Cycle Rate:

For Maximum Number of Axes = 2, 4, or 8: 2 kHz (default), 4 kHz, 5 kHz

For Maximum Number of Axes = 16 or 32: 2 kHz (default), 4 kHz

For Maximum Number of Axes = 64: 1 kHz (default), 2 kHz

The **NetworkBoost** and Segmented Motion (XSEG) features' functionality can be limited as a function of MPU Cycle Rate and Number of Axes. Please refer to the Installation Guide or contact ACS for more details.

EtherCAT Ports

Communication with an External EtherCAT Master:

EtherCAT In & EtherCAT Out, RJ45 connectors

DS402 protocol

As an EtherCAT Master:

EtherCAT In & EtherCAT Out, RJ45 connectors

NetworkBoost (optional) - Automatic network failure detection and recovery using ring topology and redundancy

Dual EtherCAT Network (optional) - Starting with V3.13, the Dual EtherCAT feature provides the ability to control two independent EtherCAT networks using a single ACS controller.

Power Supply

Input: 24VDC \pm 20%, < 0.8A

Protection: reverse polarity

Environment

Operating range: 0 to + 50°C

Storage and transportation range: -25 to +60°C

Humidity (operating range): 5% to 90% non-condensing

Dimensions

158 x 48 x 149 mm³

Weight

700 gr.

Accessories

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

Certifications

CE: Yes

EMC: EN 61326-1

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Ordering Options

	Field	Example selection by user	Optional Values
Maximum number of axes	1	08	2, 4, 8, 16, 32, 64
ECAT 3rd party Servo Drive	2	08	Equal to "Maximum number of axes"
ECAT 3rd party Step motor Drive (open & closed loop)	3	08	Equal to "Maximum number of axes"
ECAT 3rd party IO EtherCAT node	4	64	64 (FOC)
G-Code, 5 Axis Coordinated Motion ¹	5	N	N = None F = 5 Axis Coordinated Motion D = G-Code & 5 Axis Coordinated Motion G = G-code
Number of ServoBoost and ServoBoost Plus Axes	6	A	N = None A = 4 axes ServoBoost B = 8 axes ServoBoost C = 8+ axes (equal to Max Number of Axes) ServoBoost J = 4 axes ServoBoost & ServoBoost Plus K = 8 axes ServoBoost & ServoBoost Plus L = 8+ axes (equal to Max Number of Axes) ServoBoost & ServoBoost Plus
Input shaping LearningBoost , Non-Linear Control Autofocus	7	Y	N = No Y = Input Shaping L = LearningBoost C = Non-Linear Control B = LearningBoost & Input Shaping D = Input Shaping & Non-Linear Control E = LearningBoost & Non-Linear Control F = LearningBoost & Input Shaping & Non-Linear Control G = AutoFocus H = Input Shaping & AutoFocus J = LearningBoost & AutoFocus K = Non-Linear Control & Autofocus
Maximum MPU cycle rate (kHz), MotionBoost	8	4	D = Default, 2 = 2kHz ² , 4 = 4kHz ⁴ , 5 = 5kHz ^{3,4}
NetworkBoost , Flexible configuration, Dual EtherCAT Network	9	N	N = None A = NetworkBoost B = Flexible Configuration C = NetworkBoost & Flexible Configuration D = Dual EtherCAT Network E = Dual EtherCAT Network & Flexible Configuration
Number of ACSPL+ Buffers & Real-Time C Function Support	10	A	D = Default A = 16 B = 32 C = 64 E = Default & Real-Time C Function Support Enabled F = 16 & Real-Time C Function Support Enabled G = 32 & Real-Time C Function Support Enabled H = 64 & Real-Time C Function Support Enabled
Reserved	11	N	N = No
XL Scan (unit per scanner)	12	N	None(N), 1,2,...9,10(A), 11(B), 12(C), 13(D), 14(E), 15(F), 16(G)

¹ Includes 3+ Axis SmoothPath and 3+ NURBS

² Only relevant for controllers with Max Number of Axes = 64

³ 16 axes and 5 kHz (requires Dual EtherCAT Network option)

⁴ Includes MotionBoost, 2 axis SmoothPath, 2 Axis NURBS and SmoothPTP

Example: SP+ES-08080864NAY4NANN

Field	1	2	3	4	5	6	7	8	9	10	11	12
PN SP+ES-	08	08	08	64	N	A	Y	4	N	A	N	N

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