

SPiiPlus Econo Series

Economical Motion Controllers



SPiiPlus SA-LT

Economical 2, 4, 6, 8 Axes Stand Alone Motion Controller

The SPiiPlus SA-LT is especially designed for enhancing the performance of OEM machinery that requires multi-axis synchronization and low price. With its versatility, the SPiiPlus SA-LT controls systems with both servo and step motors. It provides smooth motion, high resolution and high speed without compromising accuracy and throughput. The SPiiPlus SA-LT comprises simple and convenient connectivity interface with the application's drivers, encoders, I/Os and communication bus using D-Type connectors. SPiiPlus SA-LT accurate motion control is obtained with 20kHz sampling rate, real time registration inputs and position compare outputs and ACSPL+ multi-tasking application language. A powerful suite of software tools provides high speed host communication via multiple channels and a quick application development, system setup and analysis.

Specifications

Axes

See table on next page.

Profile Generation

Trajectory Calculation Rate: 1kHz.
Position Range: $\pm 4 \times 10^{15}$ counts.
Velocity: 160×10^9 counts/second.
Acceleration: up to 4×10^{15} counts/second².

Control

Position (P) loop + velocity loop (PI, 2nd order low-pass and Notch filters).
Sampling Rate: 20 kHz.
Accuracy: ± 1 count.
Dual Loop: see table on next page.
Note: each Dual Loop consumes another axis, which should be defined as a dummy.

Feedback

Feedback types: incremental digital encoders.
Incremental Digital Encoder:
One per axis, A&B,I, UP/DN,I;
CLK/DIR,I. Type: RS-422.
Max. rate: 30 million encoder counts/sec.

Drive Interface

Analog commands: see table on next page. One torque command per axis. Type: see Analog Outputs, drive commands section. Offset compensation: programmable, 0.3mV resolution.
Pulse-Direction Commands: see table on next page.
Type: RS-422. Up to 4 million pulse/sec.
Drive enable output:
Quantity: one per axis.
Type: two-terminal, opto-isolated, sink or source. Up to 24V/20mA.
Drive Fault Input:
Quantity: one per axis.
Type: two-terminal, opto-isolated, sink or source. Input circuit current: <7mA.

Digital I/O

Safety Inputs: requires an external supply - see Controller & Power Supply section.
Emergency stop input:
Quantity: one. Type: two-terminal, sink or source, opto-isolated.
Left and right limit inputs:
Quantity: pair per axis. Type: 5V or 24V, single-ended, sink (default) or source, opto-isolated.
Safety inputs voltage: 5V or 24V.
Input circuit current: <15mA
Digital Inputs: requires an external supply - see Controller & Power Supply section.
General purpose inputs:
Quantity: eight. Type: 5V or 24V, single-ended, sink (default) or source, opto-isolated.
Input circuit current: <15mA.
Mark (position capture) inputs:
Quantity: see table on next page.
Type: RS-422.
Propagation delay: <0.1 μ sec.

Digital Outputs: requires an external supply - see Controller & Power Supply section.
General purpose outputs:
Quantity: eight. Type: 5V or 24V, single-ended, sink (default) or source, opto-isolated, 50mA per output.
PEG (Position Event Generator) pulse outputs:
Quantity: see table on next page.
Type: RS-422. Propagation delay: <0.1 μ sec.
PEG pulse width: 25nsec to 1.6msec.
PEG position accuracy: ± 1 count at up to 5,000,000 counts/sec.

HSSI Expansion Channels: see table on next page. Each channel provides 64 input bits and 64 output bits per channel, sampled and updated at 20KHz.
Type: RS-422. Up to additional 64/63 I/Os via each HSSI using HSSI-IO16 modules.

Communication Channels

Serial: two RS-232. Up to 115,200bps.
Ethernet: TCP/IP, 10/100 Mbits/sec.
Simultaneous communication through all channels is fully supported. Modbus protocol as master or slave is supported via Ethernet or Serial channels.

Analog I/O

Analog Inputs:
General purpose 1V_{rtp} analog inputs:
Quantity: see note *1 in the table on next page. Type: 1V_{rtp}, differential, 14-bit resolution.
General purpose $\pm 10V$ analog inputs:
Quantity: see note *2 in the table on next page. Type: $\pm 10V$, differential, 14-bit resolution.
Analog Outputs:
Drive commands or general purpose $\pm 10V$ analog outputs: Quantity: see note *3 in the table on next page. Type: $\pm 10V$, differential, 16-bit resolution.
General purpose only $\pm 10V$ analog outputs: Quantity: see note *4 in the table on next page. Type: $\pm 10V$, differential, 16-bit resolution.
Signal-to-noise ratio of all analog I/O: ≥ 72 dB (3 sigma).

Controller & Power Supply

User Memory: RAM: 13Mb. Flash: 13Mb.
Powerup Time: 25sec.
Power Supply Voltage/Current: 24Vdc(+/-10%)/2A.
I/O Supply Voltage/Current: +5Vdc ($\pm 10\%$)/1A, or 24Vdc ($\pm 20\%$)/1A.
Safety Supply Voltage/Current: +5Vdc ($\pm 10\%$)/1A, or 24Vdc ($\pm 20\%$)/1A.

Environment

Operating Temperature: 0°C to 40°C.
Storage Temperature: -40°C to 70°C.
Humidity: 90%RH, non-condensing.



Axes and I/O Functionality

Product	Axes and Supported Features				I/O				
	Axes with $\pm 10V$ Drive Command	Axes with P-D Drive Commands	Axes Supporting Dual Loop	G.P Digital I/O	Axes with PEG Pulse Output	Position Registration MARK Inputs	Analog Inputs	Analog Outputs	HSSI Channels
SPiiPlus SA-LT-2...	2 (XA)	1 (A)	1 (X)	8/8	1 (X)	2 per X	4(*1)	2(*3)	1
SPiiPlus SA-LT-4...	4 (XAYB)	2 (AB)	2 (XY)	8/8	2 (XY)	2 per X, 1 per Y	4(*1)	4(*3)	1
SPiiPlus SA-LT-6...	6 (XAYBZC)	3 (ABC)	3 (XYZ)	8/8	3 (XYZ)	2 per X, 1 per Y,Z	2(*1)+2(*2)	6(*3)+2(*4)	1
SPiiPlus SA-LT-8...	8 (XAYBZCTD)	4 (ABCD)	4 (XYZT)	8/8	4 (XYZT)	2 per X, 1 per Y,Z,T	4(*2)	8(*3)+2(*4)	1

*1: General purpose 1Vptp analog inputs

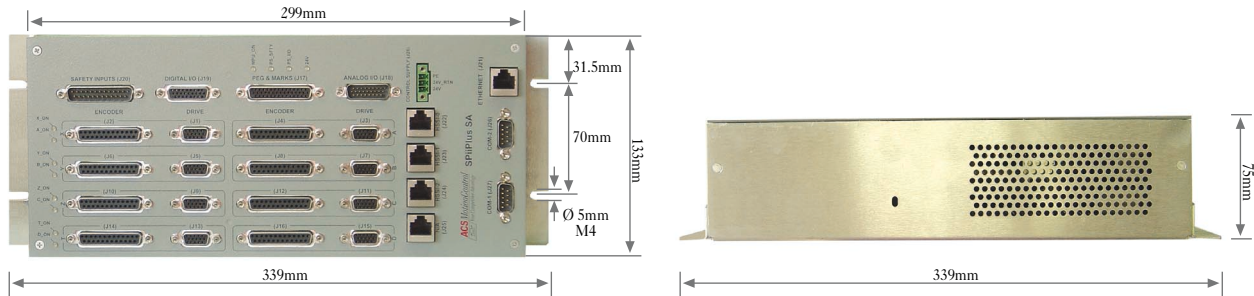
*2: General purpose $\pm 10V$ analog inputs, or general purpose 1Vptp analog inputs

*3: Drive commands or general purpose $\pm 10V$ analog outputs (by DCOM command)

*4: General purpose only $\pm 10V$ analog outputs (by AOOUT10,11 commands)

For further information about analog I/O comments, see Analog I/O Specifications

Layout & Dimensions



How To Order

SPiiPlus SA-LT Controller and Software

• SPiiPlus SA-LT Controller

Example: **SPiiPlus SA-LT - 8 - E**

Number of axes: [2] - Two axes controller [6] - Six axes controller
 [4] - Four axes controller [8] - Eight axes controller

Communication channels:
 [E] - two RS-232 and one Ethernet 10/100 Mbits/sec.

Each SPiiPlus SA-LT controller is provided with:

- One CD with SPiiPlus ADK (Advanced Development Kit) for programmers who develop ACSPL+ based applications and host based programs. The SPiiPlus ADK is free to download from our website | Download & Support | SPiiPlus Downloads | Software Installation section. The SPiiPlus ADK includes:
 - **SPiiPlus MMI** - for axis configuration, servo tuning, programming and viewing parameters
 - **SPiiPlus C and COM Libraries** - for host programming in C/C++ or Visual Basic™
 - **SPiiPlus Utilities** - for upgrading firmware and recovering from errors
 - **SPiiPlus Simulator** - for fast application development and debugging
 - **SPiiPlus FRF** - for analyzing motion frequency response
 - Hardware & setup, software and programming guides in PDF format
 - ACSPL+, C/C++ and COM training files and programming examples

Supported Motors:

±10V Commands	AC Servo/DC Brushless (commutation by drive)
	DC Brush
P-D Commands	Nanomotion Piezo-ceramic
	Step motor
	Servo motor



Additional Products

- **SPiiPlus SA-ACC:** Interface kit that includes mating connectors to SPiiPlus SA-LT panel of connectors.

Warranty

The warranty of this product is according to the Terms and Conditions of Sale and is effective for one year from date of shipment from ACS Motion Control. Copyright© August 2006 ACS Motion Control. All rights reserved. Version 1.2.

ACS Motion Control Ltd.
 Ramat Gabriel Industrial Park, POB 5668,
 Migdal Ha'Emek 10500, Israel
 Phone: +972-4-6546440 Fax: +972-4-6546443

ACS Motion Control Inc.
 14700 28th Ave. North, Suite 25
 Plymouth, MN 55447, USA
 Phone: +763-559-7669 Fax: +763-559-0110

For the most updated information please refer to www.acsmotioncontrol.com