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Find the *ACS Motion Control SPiiPlusSAR-6-E-M0* at our website: *Click HERE*

SPiiPlus SAR

Advanced 4, 6, 8 Axes Stand Alone Motion Controller



The SPiiPlus SAR meets the motion control requirements of the most demanding applications such as semiconductors manufacturing, wafers inspection and Flat Panel Display assembly and testing. The SPiiPlus SAR supports high frequency Sin-Cos encoder signals of up to 2.5MHz to provide sub-nanometer resolution at high speed without compromising accuracy and throughput. The SPiiPlus SAR comprises simple and convenient connectivity interface with the applications drivers, encoders, I/Os and communication bus using D-Type connectors. SPiiPlus SAR accurate motion control is obtained with 20kHz sampling rate, customized control algorithms, Gantry control, Sin-Cos encoder interpolation, real-time registration and position compare outputs, software commutation 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.

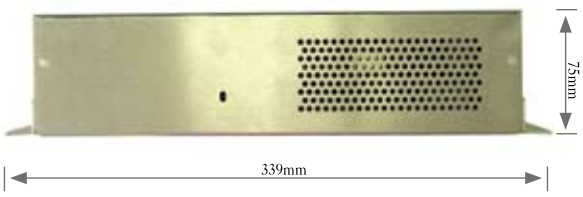
Axes and I/O Functionality

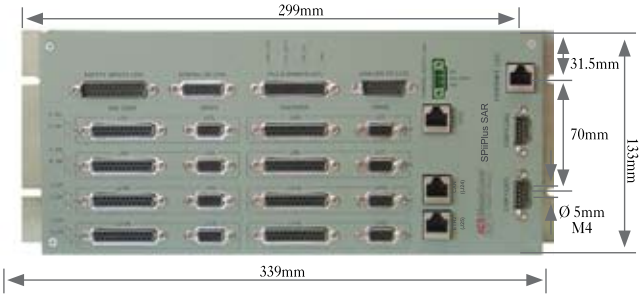
	Axes and Supported Features			I/O					
Product	Axes with ±10V Drive Command	Axes with P-D Drive Commands	Axes Supporting Dual Loop	G.P. Digital I/O	Axes with PEG Pulse Output	Position Registration MARK Inputs	Analog Inputs	Analog Outputs (*2)	HSSI Channels
SPiiPlus SAR-4...	4 (XAYB)	2 (AB)	2 (XY)	8/8	2 (XY)	2 per X, Y	0	0	2
SPiiPlus SAR-6...	6 (XAYBZC)	3 (ABC)	3 (XYZ)	8/8	3 (XYZ)	2 per X, Y 1 per Z	2(*1)	2	2
SPiiPlus SAR-8...	8 (XAYBZCTD)	4 (ABCD)	4 (XYZT)	8/8	4 (XYZT)	2 per X, Y, 1 per Z, T	4(*1)	4	2

*1: General purpose ±10V analog inputs
*2: General purpose only ±10V analog outputs
Note: When drive commands are not used, the outputs can be utilized as a general purpose ±10V analog outputs

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

Layout & Dimensions





CE RoHS

ACS MotionControl
Your Competitive Advantage

Axes

See table on previous page.

Profile Generation

Trajectory Calculation Rate: programmable 1kHz, 2kHz (default) or 4kHz.
Position Range: $\pm 4x10^{15}$ counts.
Velocity: $160x10^{9}$ counts/second.
Acceleration: up to $4x10^{15}$ counts/second2.

Control

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

Feedback

Feedback types: incremental digital encoders, optional Sin-Cos and fast Sin-Cos, analog inputs and absolute 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.

Sin-Cos Analog Encoder (optional)
Quantity: One per axis.
Type: 1Vptp, differential, 14 bit resolution.
Programmable multiplication factor: 4x to 65,536x.
Maximum rate: Up to 250,000 sine periods/second. Fast rate option up to 2,500,000 sine periods/second.
Maximum acceleration with Sin-Cos encoder: 108 sine periods/second2.

Absolute encoders:
Optional HSSI-HES - supports EnDat 2.2 (Heidenhain) and Smart Abs (Tamagawa) protocols.

Hall inputs:
Quantity: three. Type: single-ended, 5V, source, opto-isolated
Input circuit current: <7mA.

Drive Interface

Absolute encoders:
Optional HSSI-HES - supports EnDat 2.2 (Heidenhain) and Smart Abs (Tamagawa) protocols.

Analog commands:
see table on previous page. one torque command per axis or two motor phases current commutation commands. Type: see Analog Outputs, General purpose section.
Offset compensation: programmable, 0.3mV resolution.

Pulse-Direction Commands:
see table on previous 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 circut 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 circut 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 circut current: <15mA.

Mark (position capture) inputs:
Quantity: see table on previous page.
Type: RS-422 or single ended opto isolated (1 per X, Y).
Propagation delay: <0.1 µsec.

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.

Mechanical brake:
Quantity: eight. Type: 5V or 24V, single-ended, source only, opto-isolated, 7mA per output.

PEG (Position Event Generator) pulse outputs:
Quantity: see table on previous page.
Type: RS-422. Propagation delay: <0.1µsec.
PEG for X,Y can be configured by jumper JP9 to be single ended opto isolated.
PEG pulse width: 25nsec to 1.6msec.
PEG position accuracy: ±1 count at up to 5,000,000 counts/sec.

PEG state outputs:
Quantity: three per X axis. Type RS-422.
Propagation delay<0.1usec

HSSI Expansion Channels: see table on previous 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 & Networking

Serial: two RS-232. Up to 115,200bps.
Ethernet: two TCP/IP, 10/100 Mbits/sec. Simultaneous communication through all channels is fully supported.
Networking: Modbus protocol as master or slave is supported via Ethernet or Serial channels.
CANopen network master with up to 64 nodes of drives and IOs.

Analog I/O

Analog Inputs:
General purpose ±10V analog inputs:
Quantity: see table on previous page.
Type: ±10V, differential, 14-bit resolution.

Analog Outputs:
General purpose only ±10V analog outputs: Quantity: see table on previous page. Type: ±10V, differential, 16-bit resolution. Signal-to-noise ratio of all analog I/O: >=72dB (3 sigma).

Controller & Power Supply

User Memory: RAM: 128Mb. Flash: 128Mb.
Powerup Time: 25sec.
Power Supply Voltage/Current: 24Vdc(+/-10%)/2A.
I/O Supply Voltage/Current: +5Vdc (±10%)/1A, or 24Vdc (±20%)/1A.
Safety Supply Voltage/Current: +5Vdc (±10%)/1A, or 24Vdc (±20%)/1A.

Environment

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

Supported Motors:

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

How To Order

• SPiiPlus SAR Controller **Example: SPiiPlus SAR - 8 - E - M8 - F4 - I - C**

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 two Ethernet 10/100 Mbits/sec.

Number of total Sin-Cos encoder multipliers:
[M0] - no multipliers, [M1]..[M8] - up to a total of eight multipliers

Optional field - Number of fast 2.5MHz Sin-Cos encoder multipliers (out of the total):
[F1] - One, [F2] - Two, [F3] - Three, [F4] - Four

Optional field - Convolve Input Shaping algorithm to reduce vibration and settling time:
[I] - Input Shaping - enabled

Optional field: CANopen Network
[C] – PLC enabled

Each SPiiPlus SAR 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 tunning, programming and viewing parameters
- **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

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.
For further warranty information, please see the hardware guide. Copyright © October 2009 ACS Motion Control. All rights reserved. Version 1.0

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