

# SPiiPlus-LF

## Cost Effective 4 Axis Motion Controller



- Low cost and small footprint SPiiPlus 4-axes motion controller
- PLCopen compliant. Can be programmed in any of the five IEC61131-3 standard PLC languages
- Outstanding servo performance with sampling rate of 20kHz on all axes
- Supported by ACS' advanced SPiiPlus software tools

The SPiiPlus-LF 4-axis controller is designed to address the needs of cost sensitive applications where space is at a premium. The SPiiPlus-LF is more than just a motion controller; with its PLC programming and CANOpen master capabilities it can actually control your whole machine.

The SPiiPlus-LF is PLCopen compliant, in addition to ACSPL+ motion programming language, it can be programmed in any of the five IEC61131-3 standard PLC languages. Its capabilities can be extended by adding up to 64 CANopen nodes of additional axes and I/Os.

As a member of the SPiiPlus family of products, it is supported by the SPiiPlus ADK free software support package, which includes a rich set of powerful tools with full simulation capabilities for easy setup, tuning, application program development, debugging and diagnostics.

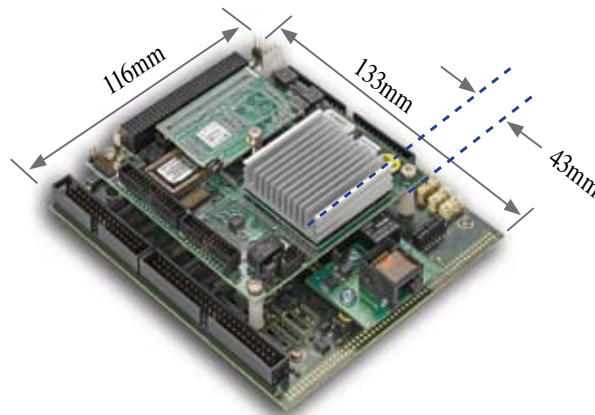
To simplify the process of prototyping the following accessories are offered: mating connectors' kit, breakout terminal kit for easy prototype connectivity, and a din rail mounting kit.

### Layout & Dimensions

Weight: 250 gram

Width x Length x Height

W x L x H - 133 x 116 x 43 mm



CE RoHS

## Axes

Four.

## Profile Generation

Trajectory Calculation Rate: 1 kHz

## Control

Position (P) loop + velocity loop (PI, 2<sup>nd</sup> order low-pass and Notch filters).  
Sampling Rate: 20 kHz.  
Dual Loop: up to 2 axes. Note: each dual loop consumes another axis.

## Feedback

Feedback type: incremental digital encoders and absolute encoders.

### Incremental digital encoders:

One per axis, A&B, I; UP/DN, I; CLK/DIR, I.  
Type: RS-422.

Max. rate: 30 million encoder counts/sec.  
Secondary encoder feedback: supports interface to a secondary incremental digital encoder using the HSSI-ED2

### Absolute encoders:

Optional High Speed Synchronous Interface (HSSI-HES) to EnDat (Heidenhain) and Smart-Abs (Tamagawa) absolute encoders.

## Drive Interface

### P/D Commands:

Quantity: two pairs of P/D signals.  
Type: Single-ended TTL.

### Analog commands:

Quantity: two per axis.  
Type: 12 bit resolution,  $\pm 10V$  differential or single ended.  
Offset compensation: programmable, 6.6mV resolution. On board potentiometers for fine tuning.

### Drive Enable Output:

Type: single ended, sink only. Up to 24V/7mA, active low.

### Drive Fault Input:

Type: single-ended, sink only, Up to 30V.  
Input circuit current: <1mA.

## Digital I/O

### Digital Inputs

#### Emergency Stop Input:

Type: two-terminal, opto-isolated.

#### Left and Right Safety Limit Inputs:

Quantity: pair per axis.  
Type: single-ended, sink (default) or source, configurable by jumper, opto-isolated.  
Safety inputs voltage: single-ended, 5V or 24V.  
Input circuit current: <15mA.

#### General Purpose Inputs:

Quantity: eight.  
Type: single-ended, opto 22 compatible, TTL, 5V.  
Input circuit current: <1mA.

#### Mark (position capture) Inputs:

Quantity: Four. Two inputs per each primary axis (X, Y).

Type: RS-422. Propagation delay: <0.1  $\mu$ sec.

### Digital Outputs

#### General Purpose Outputs:

Quantity: eight.  
Type: single-ended, TTL, opto 22 compatible.

#### Mechanical Brake Outputs:

Supported through unused digital outputs. User can choose to use them either as a digital output or as a mechanical brake outputs. By default, configured to digital outputs.

#### PEG (position event generator) Pulse Outputs:

Quantity: Two. One output per each primary axis (X, Y).  
Type: RS-422.

Propagation delay: <0.1 $\mu$ sec.

PEG pulse width: 25nsec to 1.6msec.

PEG position accuracy:  $\pm 1$  count at up to 5,000,000 counts/sec.

#### I/O Expansion via HSSI Channels:

Quantity: two. Each channel provides 64 input bits and 64 output bits per channel, sampled and updated every 50 $\mu$ s.  
Type: RS-422. Up to additional 64 I/Os via each HSSI using HSSI-IO16 modules.

## Analog I/O

Analog Inputs: N/A

### Analog Outputs:

Quantity: two  
Type: 12 bit resolution. Configurable by

jumper to be differential  $\pm 10V$  or single ended  $\pm 10V$ .

Note: can be configured to be General Purpose Analog command.

## Communication Channels

Two RS232 channels. One can be configured also as RS422/485.  
Ethernet interface: One. TCP/IP, 10/100 Mb/s/sec. Simultaneous communication through all channels is fully supported.  
Modbus protocol as master or slave is supported via all channels.

## MPU

User Memory: RAM: 128Mb (DDR 200MHz).  
Flash memory: 128Mb for user backup & firmware. Powerup Time: 25sec.

## Power Supplies

+5Vdc ( $\pm 2\%$ )/3A  
 $\pm 12Vdc$  ( $\pm 5\%$ )/0.6A  
Safety supply voltage/current: 5Vdc ( $\pm 10\%$ )/0.35A or 24Vdc ( $\pm 20\%$ )/0.35A

## Standards and Environment

Operating Temperature: 0°C to 40°C.  
Storage Temperature: - 40°C to 70°C.  
Humidity: 90%RH, non-condensing.  
The controller is RoHS compliant.

## How To Order

### SPIiPlus LF Controller and Software

#### • SPIiPlus LF Controller

Example: SPIiPlus-LF - 4 - C - D

Number of axes: [4] - Four axes controller

Optional field - PLC & CANOpen network [C] - PLC & CANOpen

Optional field - Din Rail mounting [D] - Din Rail included

Each controller is provided with SPIiPlus ADK (Advanced Development Kit) CD 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
- **PLCopen** - programming in any of the five IEC61131-3 standard PLC languages
- Hardware & setup, software and programming guides in PDF format
- ACSPL+, C/C++ and COM training files and programming examples

### Additional Accessories

- **SPIiPlus-LF-ACC:** Mating connectors kit that includes cables to the controller.
- **SPIiPlus-LF-BOB:** Breakout box kit (for easy prototype)

## Supported Motors:

±10V Commands	AC Servo/DC Brushless
	DC Brush
	Nanomotion Piezo-ceramic
P-D Commands	Step motor
	Servo motor



### International Headquarters

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