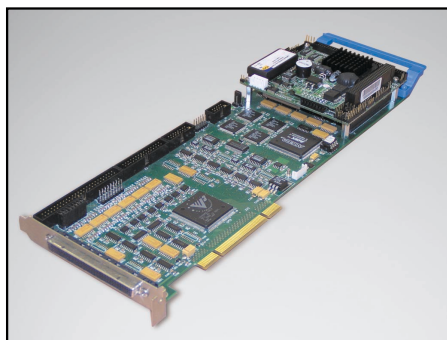


# SPiiPlus Econo Series

## Economical Motion Controllers



### SPiiPlus PCI-ST

#### Economical 2, 4 Axes Step Motor Motion Controller

The SPiiPlus PCI-ST is especially designed for enhancing the performance of OEM systems operating with step motors, and servo motor drives with Pulse-Direction interface. The SPiiPlus PCI-ST is user programmable, easy to use and cost effective. It supports up to four axes, open and closed loop control and high resolution micro-stepping. The SPiiPlus PCI-ST high performance motion control is obtained by full axes synchronization, up to 4 million steps per second, 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 below.

### Profile Generation

Trajectory Calculation Rate: 1kHz.  
 Position Range:  $\pm 4 \times 10^{15}$  counts.  
 Velocity: up to 4 million pulse/second.  
 Acceleration: up to  $4 \times 10^{15}$  counts/sec<sup>2</sup>.

### Feedback

One incremental digital encoder per axis, A&B,I; UP/DN,I; CLK/DIR,I.  
 Type: RS-422. Maximum rate: 30 million encoder counts/sec.  
 Note: encoders require external supply.

### Drive Interface

**Pulse-Direction Commands:**  
 Two commands per axis.  
 Type: RS-422. Up to 4 million pulse/sec.

**Drive Enable Output:**  
 One per axis. Type: two-terminal, source or sink. Collector emitter voltage: 5Vdc to 30Vdc. Output current: 50mA.

**Drive Fault Input:**  
 One per axis. Type: two-terminal, source or sink. Input voltage: 5Vdc ( $\pm 10\%$ ), or 24Vdc ( $\pm 20\%$ ), requires an external supply.

### Digital I/O

#### Safety Inputs:

One E-stop. Left and Right limit per axis.  
 Type: two-terminal, source or sink, opto-isolated. Input safety voltage: 5Vdc ( $\pm 10\%$ ) or 24Vdc ( $\pm 20\%$ ), requires an external supply.

#### Digital Inputs:

See table below. Can be used as general purpose or as registration mark (position capture) inputs.  
 Type: RS-422. Propagation delay:  $< 0.1 \mu\text{sec}$ .

Note: when working in open loop, the registration mark is based on the internal pulse counter. When working in closed loop, the registration mark is based on the encoder counter.

#### Digital Outputs:

See table below. Can be used as general purpose, or as Position Event Generator (PEG) outputs, or as mechanical brake outputs.  
 Type: RS-422. Propagation delay:  $< 0.1 \mu\text{sec}$ . PEG pulse width: 25nsec to 1.6msec. PEG position accuracy:  $\pm 1$  count at up to 5,000,000 counts/sec.  
 Number of PEG pulses in random (table based) mode: up to 30,000.  
 Number of PEG events in incremental mode: unlimited.

Note: when working in open loop, the PEG is based on the internal pulse counter. When working in closed loop, the PEG is based on the encoder counter.

#### HSSI Expansion Bus

One channel, providing 64 input bits and 64 output bits, sampled and updated at a 20kHz rate. Type: RS-422. Up to additional 64/63 I/Os via a single HSSI channel.

### Communication Channels

PCI Bus: 33MHz, 32-bit. Bi-directional FIFO : 512x8 in each direction.  
 RS-232/422: two ports (one can be also RS-422). Up to 115,200bps.  
 Ethernet: TCP/IP, 10/100 Mbts/sec. Simultaneous communication through all channels is fully supported. Modbus protocol as master or slave is supported via Ethernet or Serial channels.

### Controller

User Memory:  
 RAM: 13Mb. Flash: 13Mb.  
 Powerup Time: 25sec.  
 Power Supply Voltage/Current:  
 +5Vdc (-2%/+5%) /3.5A,  $\pm 12\text{Vdc}$  ( $\pm 5\%$ ) /0.25A.  
 Note: when used outside the PC, the 5V and  $\pm 12\text{V}$  must be supplied through a dedicated power connector.

### Environment

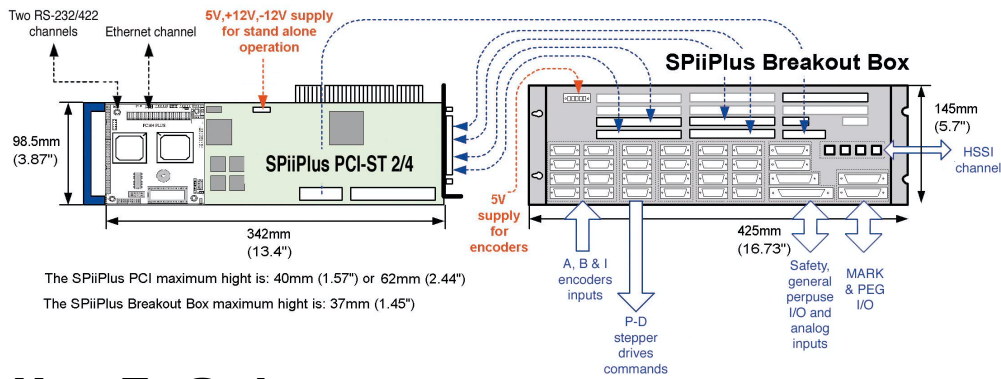
Operating Temperature:  
 0°C to 60°C.  
 Storage Temperature: - 40°C to 85°C.  
 Humidity: 90%RH, non-condensing.

## Axes and I/O Functionality

Product	Axes with P-D Drive Commands	Digital I/O	I/O	
			Axes with PEG Pulse Output	Position Registration MARK Inputs
SPiiPlus PCI-ST-2	2 (XY)	8/10	2 (XY)	2 per axes (X,Y)
SPiiPlus PCI-ST-4	4 (XYZT)	8/12	4 (XYZT)	2 per axes (X,Y,Z,T)



# Layout & Dimensions



## Supported Motors:

P/D Commands	Step motor
	Servo motor

## How To Order

### SPiiPlus PCI-ST Controller and Software

#### • SPiiPlus PCI-ST Controller

Example: **SPiiPlus PCI-ST - 4**

2 - Two axes controller    4 - Four axes controller

Each SPiiPlus PCI-ST controller is provided with:

- One communication cable (37cm/14.1") provides an RS-232 and an RS-232/422 channels via two D-sub, male, 9-pin connectors.
- 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, programming and for viewing parameters
  - **SPiiPlus Library** - for host programming in C/C++ or Visual Basic
  - **SPiiPlus Utilities** - for upgrading firmware and for error recovering
  - **SPiiPlus Simulator** - for fast application development and debugging
  - Hardware & setup, software and programming guides in PDF format
  - ACSPL+ ,C / C++ and COM training files and programming examples



### Additional Products

- **FC-52050-420**: Flat cable (20cm/7.8") - 200 pins header to four 50 pins headers
- **FC-52050-440**: Flat cable (40cm/15.7") - 200 pins header to four 50 pins headers
- **FC-52050-493**: Flat cable (95cm/37.4") - 200 pins header to four 50 pins headers
- **FC-52050-4150**: Flat cable (141cm/55.5") - 200 pins header to four 50 pins headers
- **CB-RS422-040**: RS-422 communication flat cable (36cm/14.1") - D type connector, 9 pins, male

#### • SPiiPlus PCI-INT Kit

Interface kit for easy connection of controller to system using standard D-type connectors and provided cables.

Kit includes:

- One SPiiPlus breakout box.  
Dimensions: 35mm (1.37") x 425mm (16.73") x 145mm (5.70") [H x W x D]
- One flat cable (95cm/37.4") - 200-pin header to four 50 pins headers
- One flat cable (95cm/37.4") - 50-pin headers
- One flat cable (95cm/37.4") - 30-pin headers
- One power male connector and cable (150cm/59") - for standalone operation

#### • SPiiPlus PCI-BRACKET

Mounting bracket for stand-alone controller operation.

Dimensions: 175mm (6.88") x 345mm (13.58") x 40mm (1.57") [H x W x D]



**SPiiPlus Breakout Box for easy integration and cables connection**

### For prototyping, the following products are recommended:

- SPiiPlus PCI-ST controller    • SPiiPlus PCI-INT    • SPiiPlus PCI-BRACKET (for stand-alone operation)

## 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 1.4.

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