SPiiPlus LF-CM

Cost Effective 4 Axis Control Module

- **Low cost and small footprint SPiiPlus 2 and 4 axis control module**
- **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**
- **Support one and three - phase motors; drive supply up to 60Vdc, peak phase current: 5 Amps.**
- **Supported by ACS' advanced SPiiPlus software tools**

The SPiiPlus-LF-CM 2 or 4-axis control module combines the powerful SPiiPlus controller and 2,4 universal PWM drives. It was designed to address the needs of cost sensitive applications where space is at a premium. The SPiiPlus-LF-CM is more than just a control module; with its PLC programming and CANOpen master capabilities it can actually control your whole machine.

The SPiiPlus-LF-CM 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 powerful, yet 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.

RoHS

ACS MotionControl
Your Competitive Advantage

Axes

Quantity: 2, 4.

Profile Generation

Trajectory Calculation Rate: 1 kHz

Control

Position (P) loop + velocity loop (PI, 2'nd order low-pass and Notch filters). Sampling Rate: 20 kHz. Dual Loop: up to 2 axes. Note: each dual loop consumes another axis unless an HSSI-ED2 is used for second encoder.

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 HSSI-HES - supports EnDat 2.2 (Heidenhain) and Smart Abs (Tamagawa) protocols.

Dimensions

With Din rail mounting panel (in mm):
261 length x 128 width x 90 height
Without Din rail mounting panel (in mm):
231 length x 122 width x 65 height

Integrated Digital drives

Quantity: 2, 4
Type: PWM drive.
PWM frequency: 20 kHz
Commutation type: sinusoidal
Switching method: advanced unipolar PWM
Bus Voltage: 18-60 Vdc
Phase Current Cont./Peak, sine amplitude: 4 / 5 A per axis
Phase Current Cont./Peak, RMS: 2.8 / 3.6 A
Peak current time: 1 sec
Maximum drive output voltage (phase to phase) @ max bus voltage and nominal current, sine amplitude: Vbus x 88% (Vdc, phase to phase).
Input power @ full output cont./ peak power at specified voltage: 0.7 / 1.2 @ 51Vdc
Maximum cont / peak output power @ 51 Vdc nominal bus voltage:
Per axis: 0.18 / 0.3 Kw
Minimal load: 0.25 mH @ 51Vdc. At lower bus voltage the minimum inductance value can be reduced proportionally. Please consult factory for using inductance with lower values.
Heat dissipation at full cont. power: 40 W

Drive Protection

- Over voltage
- Supply missing
- 24 Vdc control supply missing
- Phase-to-phase short circuit
- Short to ground
- Over temperature protection

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 µsec.

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: <0.1µsec.
PEG pulse width: 25nsec to 1.6msec.
PEG position accuracy: ±1 count at up to 5,000,000 counts/sec.
I/O Expansion via HSSI Channels:
Quantity: one. Each channel provides 64 input bits and 64 output bits per channel, sampled and updated every 50µS.
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: up to 4 in the two axis model, up to 8 in the four axis model.
12 bit resolution. Configurable by jumper to be differential or single ended +/-10V.
Each axis has two analog outputs, which are active only when the axis is defined as dummy.

Communication Channels

Two RS232 channels. Ethernet interface: One. TCP/IP, 10/100 Mbits/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
Flash memory: 128Mb for user backup & firmware.
Powerup Time: 25sec.

Power Supplies Required

Control Power Section
+5Vdc (±2%)/3A
±12Vdc (±5%)/0.25A
Safety supply voltage/current: 5Vdc (±10%)/0.5A or 24Vdc (±20%)/0.5A
Drive Power Section
The drive must be supplied by two power sources. A motor supply of 18-60Vdc/14A and a control 24Vdc (+/-10%)/1A supply. During emergency conditions there is no need to remove the control 24Vdc source.

Standards and Environment

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

How To Order

SPiiPlus LF-CM Controller and Software

• SPiiPlus LF-CM Controller **Example: SPiiPlus-LF - CM - 4 - C - D**

Number of axes:
[4] – Four axis control module; [2] – two axis control module

Optional field: CANopen Network
[C] – PLC enabled

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
- Hardware & setup, software and programming guides in PDF format
- ACSPL+, C/C++ and COM training files and programming examples

Additional Accessories Products

- **SPiiPlus-LF-CM-ACC:** Mating connectors kit that includes cables to the control module.
- **SPiiPlus-LF-CM-BOB:** Breakout box kit (for easy prototype)

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.

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