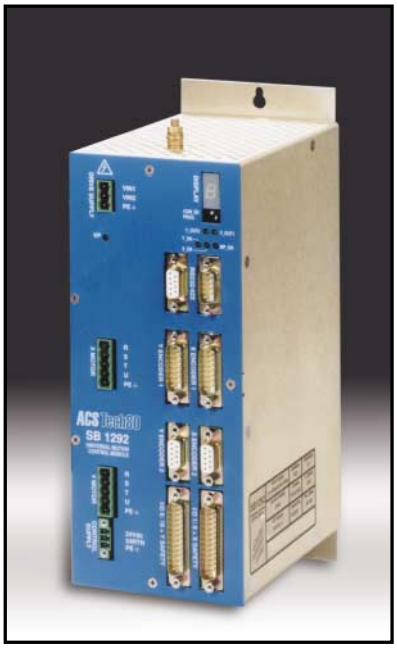
ACS MotionControl
Your Competitive Advantage

SB1292
2-Axis Universal Motion Control Module

Motion Control Module with 500-1000W Digital Drives Offers Dual-Axis Control for AC Servo, DC brush and AC Induction Motors.



Supported Motors:
AC Servo/DC Brushless
DC Brush
Stepper

The SB1292 control module is the combination of an advanced programmable controller with two digital drives. These universal drives are software configurable for the following motor types: AC Servo (AC synchronous), DC brush and AC induction motors and features automatic sinusoidal commutation setup for any three-phase motor. Two power levels are available: 7.5A (15A peak) 18-45VAC (24-60VDC) and 6.0A (12A peak) 45-120VAC (60-180VDC).

The SB1292 supports encoder (+Hall) or resolver (12-bit resolution) as primary feedback and an encoder as secondary or master feedback. In addition to dedicated safety inputs, it has sixteen inputs, sixteen outputs, two analog inputs and two analog outputs.

ACS Motion Control control modules are based on state-of-the-art, proprietary technology that has proven itself in many demanding applications, such as semiconductor assembly and testing, electronic assembly and inspection, digital printing, medical imaging, and packaging. Built-in capabilities simplify programming common applications, such as advanced pick & place, master/slave, and electronic gearing and camming.

The modules can be programmed to handle motion, time and I/O events. They can operate stand-alone, without a PLC or a PC, and communicate via RS-232/422/485 serial link.

Windows tools are provided for set-up and tuning of the control modules and for developing application programs. Libraries for Microsoft C/C++, Borland C/C++ and Visual Basic are available for DOS, Windows 3.11/95/98/2000/NT.
The libraries support multithreading in Windows NT.

Every module is manufactured under an ISO9001 certified quality management system, meets stringent safety and EMC standards, and is CE and UL compliant.

- Fully two axis Programmable Stand-alone and Host-Interfaced Operation
- Powerful I/O Handling with Advanced PLC Capabilities
- 20kHz Sampling Rate
- Modifiable Servo Algorithms
- Advanced Real-Time Position Event Generator-PEG
- Optional Resolver Feedback
- Integrated Digital Drive with Advanced 20kHz PWM Power bridge
- Comprehensive Safety, Diagnostics and Protection
- Interactive Application Development Suite
- Comprehensive C, C++ and Visual Basic libraries for DOS, Windows 3.x/95/98/2000/NT

Main Features

Main Features

Fully Programmable Standalone and Host-Interfaced Operation:

- Easy to program using ACSPL, a powerful high level language common to all SB-Series control modules
- 32k of user-programmable memory
- General Purpose I/O: 16 inputs and 16 outputs, all opto-isolated
- Two 12-bit analog inputs that can be used for feedback, such as, force and position control
- Two 10-bit analog outputs for monitoring and additional control functions
- Powerful I/O handling with advanced PLC capabilities
- Teach & go for up to 1,024 points
- RS-232/422/485 high-speed serial communications interface, up to 57600 baud rate

Special Features for Demanding Applications:

Master/Slave: This mode is characterized by its following accuracy, superimposed move capability, ability to switch "on-the-fly" from slave mode to velocity mode and vice versa through comprehensive software support. This feature has proven itself in challenging applications such as industrial flying shears, coil winding, multi-color printing and high-accuracy scanning and plotting.

Registration: This feature allows the destination position of the axis to be changed on-the-fly based on the position of an external sensor captured during a move. Registration has a variety of uses including labeling and high-speed printing. The 'Search-For-Contact' registration mode is specifically designed for pick and place applications such as wire bonding, die attachment and SMT assembly.

Position Event Generator (PEG): The PEG function generates real time, position-triggered output to activate external events based on position. It has a position compare accuracy of +/-1 count at up to 5 million counts/second, and is designed for such demanding applications as high accuracy laser cutting and automatic optical inspection (AOI) and scanning systems.

Universal Digital Drives:

- Software configurable for AC Servo (DC Brushless), DC brush, and AC induction motors
- High performance digital current control
- State of the art 20kHz PWM power bridge with optimized current ripple and efficiency
- Sinusoidal commutation with automatic setup for three-phase motors

Outstanding Performance and Capabilities:

- Fully digital position, velocity, and current control at 20kHz sampling rate, for excellent dynamic and tracking performance
- Special built-in features and support for AC Servo (DC Brushless) linear motor applications Dual loop capability supports two encoders per axis, one mounted on the motor and
- one on the load, for accurate belt-driven and lead-screw based applications

Comprehensive Safety, Diagnostics, and Protection:

- Programmable automatic routine for each fault, error, and exception
- Real-time data collection of one or two variables, programmable sampling rate up to 1kHz.
- Two separate power supplies: 24VDC backup supply for the control section, 24-60VDC (18-45VAC) or 60-180VDC (45-120VAC) for the power section
- 7-Segment display for error, status, and programmable messages
- CE marked, meets European safety standard EN60204-1 and EMC standards EN50081-2 (emission) and EN50082-2 (immunity)

Powerful Programming and Support Tools:

- ACS Adjuster for Windows: Interactive tool for setting up and tuning
- ACS Debugger for Windows: Development environment for ACSPL applications
- ACS Saver/Loader for Windows: Tool for copying system setup and application data from one controller to another
- ACSLIB C Libraries: Comprehensive C, C++, and Visual Basic libraries for DOS, Windows 3.11/95/98/2000/NT

Product Specifications

Position Control:

Sampling Rate: 20kHz

Control Algorithms: Pgain, acceleration feed-forward, automatic velocity feed-forward, integral limit.

Trajectory Calculation Rate: 1kHz

Range: ±999,999,999 counts

Accuracy: ±1 encoder count

Position Feedback:
Primary: Incremental encoder (+ Hall) or resolver
Secondary: Incremental encoder only

Encoder:
Incremental, 3 channel (A, B, I), differential line drivers, 0-5V
Supply Voltage: 5V
Maximum current consumption from onboard supply: 100mA per encoder (400mA total) (Use external supply if higher current is needed)

Hall: 3 channel, 0-5V or equivalent commutation tracks

Resolver: (option must be specified with order)
Onboard RDC: 12-bit resolution (4096 counts/rev), 1kHz bandwidth
Reference Frequency: 5-7kHz
Reference Voltage: 4V±20% rms
Reference Current (@5kHz): <25mA rms
Transformation Ratio: 0.5
DC Resistance: Rotor >15ohms, stator >40ohms
Pole Pairs: 1

Dual Loop Capability:
Primary feedback (encoder only) for velocity and commutation, secondary feedback (encoder only) for position

Position Registration Delay:
<1µsecond

Position Event Generator (PEG™):
Output: Differential line driver, 0-5V
Delay: <0.2µsecond
Position Compare Accuracy: ±1 count at up to 5,000,000 counts/second
Repetition Rate:
Random Mode: 5 events/0.001second
Incremental Mode: Up to 1MHz

Velocity Control:

Sampling Rate: 20kHz

Control Algorithm:
PI +second order low pass filter

Range: Up to 128,000,000 counts/second

Resolution: 1 count/second

Incremental Encoder Count Rate:
Up to 32,000,000 counts/second

Velocity Accuracy:
Long Term: 0.005%
Short Term: 0.01%-0.5% (system-dependent)
Acceleration Range:
Up to 2,000,000,000 counts/second^2
Acceleration build-up time (Smooth Factor):
1-255 millisecond

Communications:

Standard:
RS232/422/485, up to 57,600 baud rate

Drive:

Type: PWM, digital current control

PWM Frequency:
20kHz, programmable

Motor Types: AC induction, DC brush, AC servo/synchronous (DC brushless)

Current Loop Sampling Rate: 20kHz

Control Algorithm: PI

Current Resolution: 12 bit

Bus Voltage:
SB1292B: 24-60VDC
SB1292D: 60-180VDC

Phase Current (Sine Wave Amplitude):
SB1292B:
7.5A continuous,15A peak for 1 second
SB1292D:
6.0A continuous,12A peak for 1 second

Minimum Inductance: 0.25mH

Current Ripple:
<0.1A (60VDC, 6A, L=2mH)

I/O:

Safety Inputs:
Left and right limit per axis, E-stop

General Purpose Inputs: 16

General Purpose Outputs: 16, 50mA/output, maximum total current 350mA (per eight outputs)

Features Common to Safety & General Purpose I/O:
Fed by common external supply via the I/O connector
Type: Source, Opto-isolated (contact factory for other configurations)
Response Time: <1msecond
External Supply Range: 5VDC (10%) or 24VDC (20%), detected automatically

Analog Inputs: One per axis. Differential, ±10V, 12-bit resolution

Analog Outputs: One per axis. Single ended, ±10V, 10-bit resolution

Power:

Separate Supplies: Drive and Control (For I/O supply, see I/O section above) Isolated Transformer must be used to meet CE requirements.

Drive:
SB1292B: 24-60VDC (18-45VAC)
SB1292D: 60-180VDC (45-120VAC)

Control (Backup): 24VDC ±20%,30W

Regeneration:
R=100ohms, 100W

Controller:

Dual Processor Architecture:
- 20MHz Intel 80C196KD for high-level tasks and management
- 80MHz SB2500 ACS Servo Processor per axis for real-time control tasks

Memory:
Firmware: 256k
RAM: 256k
Nonvolatile Memory:
128k, 100,000 write cycles
User Program Memory: 32k

Specifications

Dimensions

How To Order

EXAMPLE **SB1292 - B - E - R - A**

B D	18-45VAC, 7.5A or 24-60VDC, 7.5A 45-120VAC, 6.0A or 60-180VDC, 6.0A
E R	Encoder Feedback Resolver Feedback
R	RS232/422/485
A	All Firmware Options Included

(Documentation and ACSPL software tools are included)

ACSLIB	ACSPL C, C++ and Visual Basic Libraries
1381SUP	Power Supply 115/230 VAC to 17/45/80 VAC, 9/6/3A respectively-no supply for the control section (24VDC)

Warranty

The warranty of this product is according to the Terms and Conditions of Sale and is effective for one year after shipment from ACS Motion Control. For further warranty information, please consult the hardware manual.

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