



DC Brush DC Brushless Stepper

PMD DSP Control Chip with Enhanced Custom I/O Chip

Individual Axis Home, Limits, Drive Fault Input, and Drive Enable Output

16-Bit Analog and 10-Bit PWM Command Signal Output

Dedicated Hardware Position Capture Registers

32-Bit Position, Velocity, Accel & Jerk Registers

Open Architecture Software Libraries for C, C++ and Visual Basic and Drivers for DOS (16-Bit) and Win95/98/NT (32-Bit DLLs)

Compliant with PC/104 Specification Version 2.3

The 595x Series PC/104 Motion Controllers

Compact and Durable Controllers Offer cost Effective Solutions for High-Speed DC Brush, DC Brushless and Stepper Motors.

The 595x Series delivers host-dependent, high-speed motion control for up to four axes. These compact, low cost designs, make them ideally suited for embedded applications with little space to spare.

Within its compact, 3.6" x 3.8" design, the heart of this series is their PMD DSP chipsets. These chipsets handle the PID with velocity feedforward servo algorithm for all axes. The dedicated DSP frees the host CPU for other tasks and protects motion control activities from host software problems.

Using the 5951B, systems with high jerk values and steep acceleration curves can adjust phase lag at high speeds. This compensates for physical limitations of DC brushless (AC servo/synchronous) motors, keeps motor temperature to a minimum and maximizes torque.

The 5954BP offers high speed stepper indexing for up to four axes with automatic alerts on profile failures. An incremental encoder input per axis provides position feedback for on-the-fly stall detection. The inputs use encoders to cross-reference the actual versus desired position with a presettable tolerance window for stall detection. Stalls are announced in the status register or can generate interrupts.

The 595x series features dedicated hardware position capture registers. These registers provide a high accuracy of ± 1 count at 1 MHz.

Designed to be rugged, these models offer high-speed clamping diodes provide extended transient protection against external spiking and noise. Extensive current limiting resistors harden its hardware for industrial environments. The hardware is also software configurable (all configurations are stored in nonvolatile memory).

Specifications

FULLY PROGRAMMABLE OPERATION:

- PMD DSP Control Chipset
- S-Curve, Trapezoidal and Velocity Motion Profiles
- 32-Bit Position, Velocity, Accel and Jerk Registers
- PID with Velocity Feedforward Servo Control Loops (5950B and 5951B)
- 14.7 kHz External Sinusoidal Commutation, Hall-based or Algorithmic Initialization, Velocity Phase Advance Capabilities and Electronic Gearing (5951B)
- 1.6 MHz maximum Step Rate (5954BP)
- Stall Detection capabilities with encoders attached (5954BP)

CONTROLLER CHIPSETS:

- PMD MC1401A 25 MHz DSP (5950B, 5950BP)
- PMD MC1231A 25 MHz DSP (5951B)
- PMD MC1451A 25 MHz DSP (5954BP)
- Custom interface CPLD

POSITION & VELOCITY CONTROL:

Modes of Motion: Point-to-Point, Trapezoidal, S-Curve and Electronic Gearing

Update Rates:

5950: 10kHz (1 axis enabled), 2.5kHz (4 axes enabled)

5951: 3.6kHz, 1.8kHz (2 axes enabled)

5954: 3.0kHz (4 axes enabled)

Commutation Rate: 14.7kHz (5951 only)

Position Range: ± 1.07 Billion Counts

Velocity Range: up to 16,384 Counts/Sample Time

Acceleration:

S-Curve: ± 0.5 Counts/Sample-Time²

All Others: $\pm 16,384$ Counts/Sample-Time²

JerK: 0 - 0.5 Counts/Sample Time³ (Resolution: 1/65K) (S-curve only)

Position Accuracy: Within ± 1 count

MOTOR COMMAND OUTPUTS:

- Analog (Monotonic DAC) at 16-bit resolution (5950B)
- PWM at 10-bit resolution (5950BP)
- Analog (Monotonic DAC) at 16-bit resolution with two analog outputs (5951B)
- Output for digital Step, Direction and At Rest per axis, 1.56 MHz maximum step rate, 50% nominal duty cycle

LIBRARY PROGRAMMING AND OS DRIVER:

- Open Architecture Software Libraries for Standard Complies
- Drivers for DOS: Borland 3.1 and Microsoft 1.52
- Drivers for Win95/98/NT (32-Bit): Visual C++ and Visual Basic

POSITION FEEDBACK:

Incremental Encoder (x4): 1.0 MHz, Differential or Single-Ended, quadrature error detection

PROGRAMMABLE INTERRUPT SOURCES:

- Limits
- Time/Position Breakpoint
- Trajectory Complete
- Excess Position Error (5950B, 5950BP and 5951B)
- Stall Detection (5954BP)

I/O:

Axis Dedicated I/O: TTL Compatible, 4.0 mA Sink on Outputs

Axis Inputs: Positive & Negative Limits, Home Input

POWER REQUIREMENTS (NO EXTERNAL LOAD):

+5.0 VDC: $\pm 5\%$ (0.75A), ± 12 VDC: $\pm 5\%$ (10mA)

NOTE: External analog, digital, and encoder power loads are in addition to the maximums shown.

PHYSICAL DIMENSIONS:

3.6 x 3.8 x 0.9" (90 x 96 x 23mm)

Need more information on the 595x Series? Please visit:

<http://www.acs-tech80.com/products/595x/>

How To Order

5950B	4 Axis Analog Outputs
5950BP	4 Axis PWM Outputs
5951B	2 Axis Analog Sinusoidal Commutation Outputs
5954BP	4 Axis Pulse and Direction
595XB DEV	Development Kit
595XB NT DEV	Development Kit with NT Drivers
PMD FAMILY NT	Windows NT Drivers
595XB MAN	Hardware & Software Manual Set*
SOFT CD	5XXXX Series Software/Documentation*
CAB50NS-36	Cable Interface - 36" (2 Required)*
TB50N-S	50-Pin Terminal Board (2 Required)*

* Included in the Development Kit

Warranty

This product is warranted according to the Terms and Conditions of Sale and is effective for one year after shipment from ACS-Tech80. For further warranty information, please consult the hardware manual.

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REDEFINING MOTION CONTROL

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