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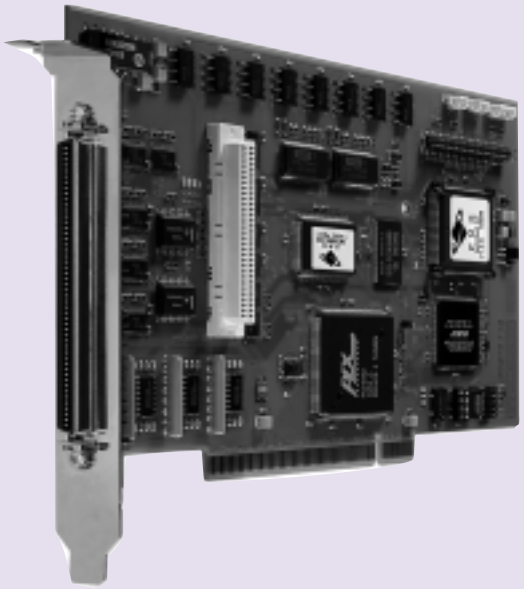
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Find the *Performance Motion Devices 8372033* at our website: *Click HERE*

Navigator-PCI™ Motion Controller For Brushed/Brushless Servo, Microstepping or Step Motors

Features



- Available in 1, 2 and 4-axis configurations.
- DC brushed/brushless servo, microstepping or step motors.
- Motion profiles include S-curve, trapezoidal, velocity contouring and electronic gearing.
- Independently programmable acceleration and deceleration.
- Advanced PID filter with velocity and acceleration feed forward, bias offset and 32-bit position error.
- Velocity, acceleration and position changes on-the-fly for trapezoidal and velocity-contouring profiles.
- Incremental encoder quadrature input and optional parallel input for absolute encoder or resolver.
- 512KB onboard memory to store complex motion sequences and trace variables.
- Trace capabilities for system performance checks, servo-tuning, maintenance and diagnostics.
- Encoder rate to 5.0 Mcounts/sec allows use of fine resolution feedback devices.
- 10-bit 20 kHz PWM or 16-bit DAC motor control output to amplifier for servos. Up to 5 MHz pulse and direction output for step motors.
- Advanced breakpoint capability allows precise sequencing of events.
- PLC-style programmable inputs and outputs, including per-axis programmable inputs and outputs.
- 8 general purpose digital inputs and outputs, 4 amplifier enable outputs.
- 8 general-purpose analog inputs.
- Two-directional limit switches, index input and home/high speed latch input indicator per axis.
- Axis settled indicator and tracking window in addition to automatic motion error detection.
- Synchronization Input/Output for multi-card systems.

General Description

The Navigator-PCI™ Motion Controllers for brushed/brushless servo, microstepping or step motors are PCI-Bus cards that fit directly into a PCI-Bus slot. The Navigator-PCI boards are used in control systems for industrial control, automation and robotic applications. They are available in 1, 2 and 4-axis configurations. The boards are designed for surface mount technology and use PMD's Navigator chipset, for either DC brushed/brushless servo motors, a combination of both, or microstepping or step motors. They are equipped with additional 512 KB memory to store extensive motion sequences and/or motion trace information to perform complex motion profiles without interrupting the host and to store motion trace information to gather comparison values for system performance checks, servo-tuning, maintenance and diagnostics.

With 124 to 168 commands, depending on model, the Navigator-PCI instruction set offers flexibility and versatility to software application programmers. Instructions are used to initialize and control the motion controller. User selectable profiling modes supported by the motion controller include S-curve, trapezoidal, velocity contouring and electronic gearing. The Navigator-PCI accepts input parameters such as position, velocity, acceleration and jerk from the host and generates a corresponding trajectory on-the-fly.

The Navigator-PCI cards are extensively supported by state of the art software tools, resources and programs. Pro-Motion™ software, a Windows™ Graphical User Interface (GUI), provides a quick and convenient way to exercise the card. It allows system parameters, profile information and other useful motion information to be set and stored. In addition, Pro-Motion provides a powerful “motion oscilloscope” function that allows up to four real-time motion variables to be displayed at the same time, simplifying servo tuning and machine performance optimization. Complementing Pro-Motion is C-Motion™, an Application Programmer’s Interface (API) comprised of a C-source code library for developing applications in DOS or Windows environments.

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Technical Specifications

Available configurations	1, 2 or 4-axis, half size PCI-Bus card
Operating modes	***Closed loop*** (motor command is driven from output of servo filter) ***Open loop*** (motor command is driven from user-programmed register)
Communication modes	16/16 parallel
Position range	-2,147,483,648 to +2,147,483,647 counts
Velocity range	-32,768 to +32,767 counts/sample with a resolution of 1/65,536 counts/sample
Acceleration & deceleration ranges	-32,768 to +32,767 counts/sample^2 with a resolution of 1/65,536 counts/sample^2
Jerk range	0 to 1/2 counts/sample^3, with a resolution of 1/ 4,294,967,296 counts/sample^3
Profile modes	***S-curve point-to-point*** (Velocity, acceleration, jerk and position parameters) ***Trapezoidal point-to-point*** (Velocity, acceleration, deceleration and position parameters) ***Velocity-contouring*** (Velocity, acceleration and deceleration parameters) ***Electronic gear*** (Encoder or trajectory position of one axis used to drive a second axis. Master and slave axes and gear ratio parameters)
On the fly control	Of profile and filter parameters with pre-load and individual axis or simultaneous multi-axis update
Electronic gear ratio range	-32,768 to +32,767 with a resolution of 1/65,536 (negative and positive direction)
Filter modes (not for step motor versions)	Scalable PID + Velocity feedforward + Acceleration feed forward + Bias. Also integration limit, settable derivative sampling time and output motor command limiting
Filter parameter resolution (not for step motor versions)	16 bits
Position error tracking	Motion error window (allows axis to be stopped upon exceeding programmable window) Tracking window (allows flag to be set if axis exceeds a programmable position window)
Motor output modes	DAC: 16 bits ±10V output PWM: 10-bit resolution at 20 KHz (1 and 2 axes); 10 KHz for 4 axes 50/50 supports 2 or 3 phase motors Sign magnitude supports 2 phase motors only Pulse and Direction Output: 5 MHz, TTL & Differential
Hall sensor inputs (brushless version only)	3 Hall effect inputs per axis (TTL level signals)
Commutation rate (brushless version only)	10 Khz (4 axes version), 20 KHz (1 and 2 axes version)
Maximum encoder rate	Incremental (up to 5 Mcounts/sec)
Servo loop timing range	100 µsec nominal for brushed versions (exact time is 102.4 µsec) per enabled axis 150 µsec nominal for brushless versions (exact time is 153.6 µsec) per enabled axis
Limit switches	2 per axis: one for each direction of travel,digitally filtered
Position-capture triggers	2 per axis: index and home signals (high speed position latch)
Other digital signals (per axis)	1 AxisIn signal per axis, 1 AxisOut signal per axis
Software-invertible signals	Encoder A, Encoder B, Index, Home, AxisIn, AxisOut, PositiveLimit, NegativeLimit (all individually programmable per axis)
Analog input	8 x 10-bit analog inputs (0 - 4.096 V)
RAM/external memory support	512 KBytes (128 K Double Word Memory Positions)
Trace modes	One-time Continuous
Number of trace variables	27 (only 4 can be viewed at the same time)
Number of host instructions	124-168
Emergency stop	5V TTL input (either for smooth stop, abrupt stop or motor off) uses the AxisIn signal
I/Os	8 digital inputs / TTL, active low 4 axis specific inputs 8 digital outputs / TTL, active low DAC: 16 bits ±10V output 4 digital outputs for amplifier enable 4 axis specific outputs 8 analog inputs (0 - 4.096 Volts)
Special profile mode combinations	Trapezoidal mode with Electronic gearing S-curve mode with Electronic gearing
Master/Slave change	Automatic Master/Slave change possible if programmed in user-defined Software
Motor check	Programmable max. motion error with or without automatic motor shutdown
Connectors	100 position AMP connector Brushless Option Adapter: 68-position cable with adapter board & connector
Dimensions	Half size PCI-Bus card; 6.9 in. x 4.4 in.
Power Supply	4.80V to 5.25V, 1A

Ordering Information

# of Axes	Brushed Servo	Brushless Servo	Micro Stepping	Step Motor	Multiple Motor [Brushed/Brush-less Servo]
1 w/o SYNC	MB902110	MB902310	MB902410	MB902510	N/A
2 w/o SYNC	MB902120	MB902320	MB902420	MB902520	MB902820
4 w/o SYNC	MB902140	MB902340	MB902440	MB902540	MB902840

# of Axes	Brushed Servo	Brushless Servo	Micro Stepping	Step Motor	Multiple Motor [Brushed/Brush-less Servo]
1 with SYNC	MB902113	MB902313	MB902413	N/A	N/A
2 with SYNC	MB902123	MB902323	MB902423	N/A	MB902823
4 with SYNC	MB902143	MB902343	MB902443	N/A	MB902843

OPTIONS:
Cable-1003 or Cable-1006 - Matching shielded cable, 100 positions to 100 positions
Cable-3003 - adaptor board with additional cable to bring out additional signals included for brushless and microstepping versions; step version additional upon request, if inverted step and direction signals are required
IM-1000 - interface and interconnect board (1 for each set of 4 axes); Mounting: Phoenix EN snap-on rail
DC-1000 - Daughter card for SSI-format encoders
*For industrial temperature versions please contact PMD.

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