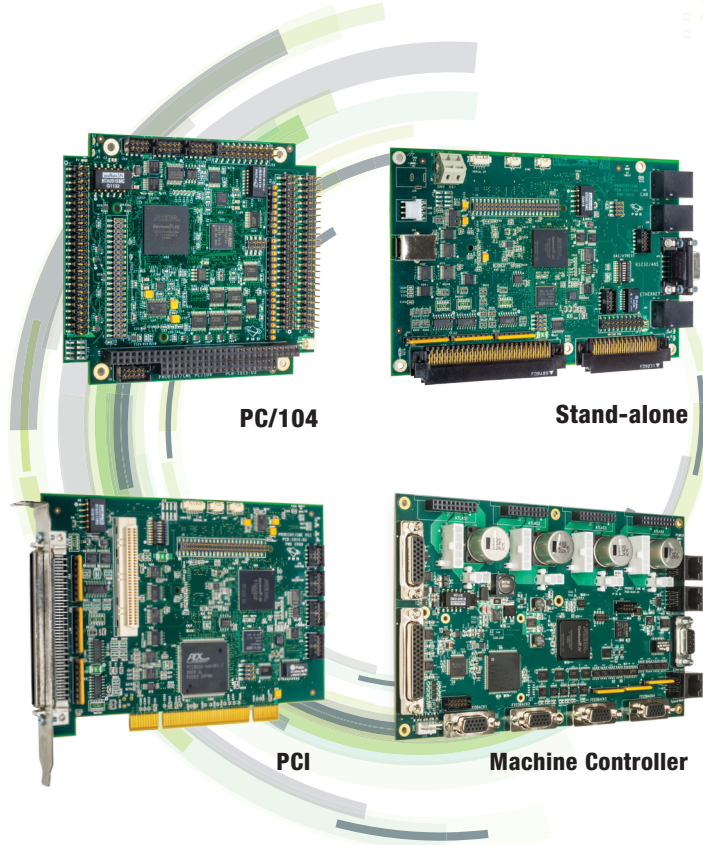


Prodigy® Motion Boards



PC/104

Stand-alone

PCI

Machine Controller

Prodigy® Motion Boards

provide high performance board-level motion control for scientific, automation, industrial, and robotic applications. Available in PCI, PC/104, standalone, and machine controller configurations, these boards support multiple motor types including brushless DC, step, and DC brush motors, and are available in 1, 2, 3, and 4-axis configurations. Programmable versions of the board include PMD's C-Motion Engine that allows user code to run directly on the board, off-loading the system host or enabling stand-alone operation. The Machine controller version has on-board Atlas amplifiers that eliminate the need for external amplifiers along with enhanced analog and digital I/O.

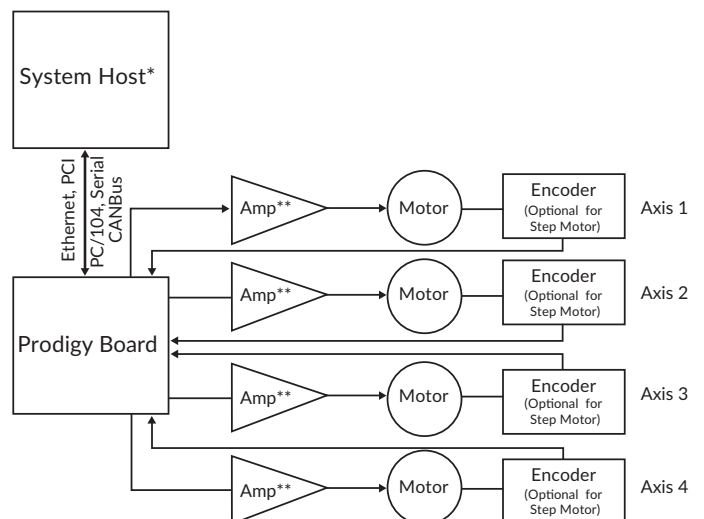
Based on PMD's industry-leading Magellan® Motion Processor, the Prodigy boards provide user-selectable profile modes including S-curve, trapezoidal, velocity contouring, and electronic gearing with on-the-fly parameter change. Servo loop compensation utilizes a full 32-bit position error, PID with velocity and acceleration feedforward, integration limit and dual biquad filters for sophisticated control of complex loads.

The Pro-Motion GUI makes it easy to set-up and analyze system parameters and motion performance. PMD's C-Motion and VB-Motion libraries simplify the program development process and allow the use of industry standard C/C++ or Visual Basic programming languages.

> FEATURES

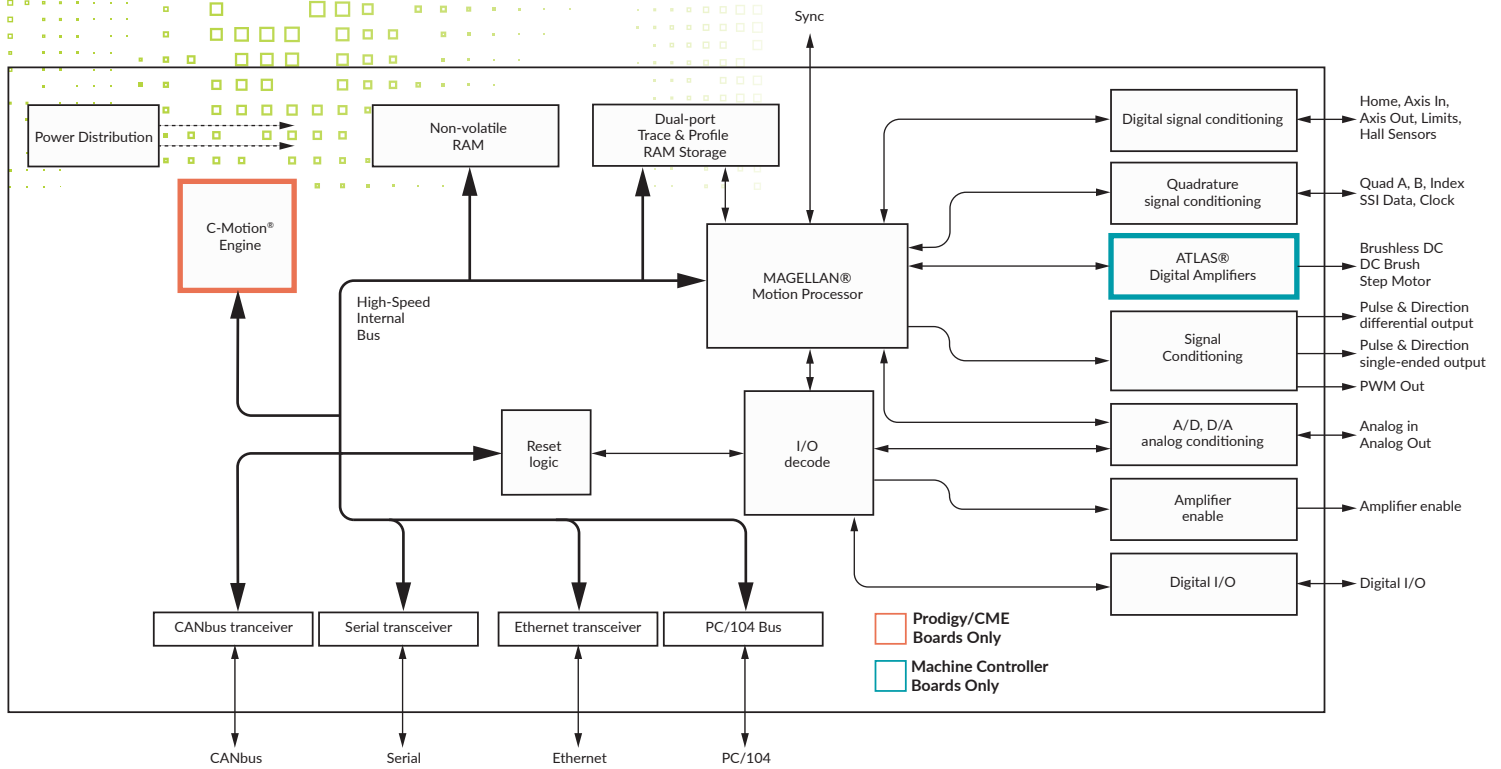
- Uses PMD's advanced Magellan® Motion Processor
- High precision 16-bit DAC or PWM amplifier output
- PCI, PC/104, Stand-alone, and Machine-controller configurations
- General purpose digital I/O and analog I/O
- Available in 1, 2, 3, and 4-axis configurations
- Two directional limit switches, plus high speed index, and home inputs per axis
- Supports brushless DC, step, and DC brush motors
- S-curve, trapezoidal, electronic gearing, and velocity-contouring
- C-MOTION® ENGINE VERSIONS
- PC/104 (ISA), PCI-bus, Ethernet, CANbus or serial communications
- Board-level execution of C-Motion code
- Advanced PID filter with feedforward and dual biquad filters
- Downloaded user application code runs at 96 MIPs
- High speed loop rate: 50 µsec/axis
- C-Motion Engine development tools
- Up to 256 microsteps per full step resolution
- MACHINE CONTROLLER VERSION
- Incremental quadrature and Absolute SSI encoder support
- On-board high performance Atlas® amplifiers
- Includes Pro-Motion®, C-Motion® and VB-Motion® development software
- Extensive fault detection including over & undervoltage, motor short, and overtemp
- 6-step commutation and field oriented control modes
- Up to 1KW peak output power per axis
- Single voltage supply drives motors and board logic

> CONFIGURATION



*System host optional for Prodigy Programmable PC/104 and Stand-Alone boards
**External amps used with non-Machine Controller board

Technical Overview



> SPECIFICATIONS

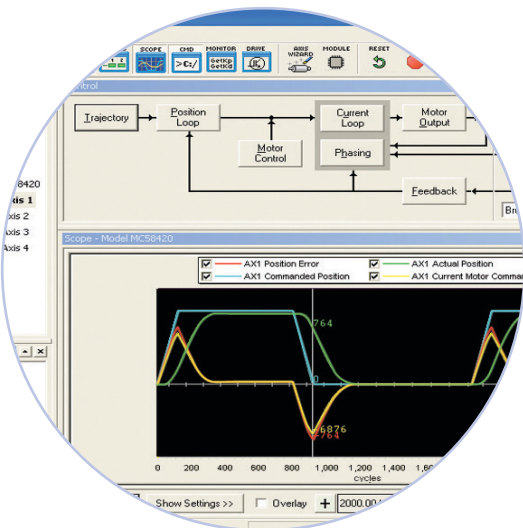
	PC/104	PCI	Stand-alone	Machine Controller
Configurations	Standard or CME	Standard or CME	CME	CME
Model	PR82 or PR83	PR92 or PR93	PR13	PR33
Number of axes supported	1, 2, 3 or 4 axes			
Supported motor types	DC Brush, Brushless DC, Step motor			
Servo loop rates	51.2 µsec to 1.6 sec. Minimum depends upon number of enabled axes and use of trace			
Encoder formats supported	quadrature, Absolute SSI			
Quadrature decode rate	8 Mcounts/sec	8 Mcounts/sec	8 Mcounts/sec	40 Mcounts/sec
Capability for onboard amplifier	No	No	No	Yes, Atlas Digital Amplifier
Motor output signals	Analog ± 10V, PWM, pulse & direction	Analog ± 10V, PWM, pulse & direction	Analog ± 10V, PWM, pulse & direction	Analog ± 10V
General purpose digital I/O	8 input, 8 output	8 input, 8 output	8 input, 8 output	8 bi-directional, 4 input, 4 output
General purpose analog input	8 10-bit channels (0 to 3.3V)	8 10-bit channels (0 to 3.3V)	8 10-bit channels (0 to 3.3V)	8 16-bit channels (-10V to +10V)
General purpose analog outputs	N/A	N/A	N/A	8 16-bit channels (-10V to +10V)
Limit switches	2 per axis: one for each direction of travel			
CME version user program memory	256 KB Flash / 8 KB RAM			
CME version stack memory	8 KB RAM			
Dual ported RAM memory	40KB (standard), 64KB (CME)	40KB (standard), 64KB (CME)	64KB	128K or 468K (enhanced memory option)
Communication modes	Standard: PC104 bus, serial, CANbus CME: PC104 bus, serial, CANbus, Ethernet	Standard: PCI bus, serial, CANbus CME: PCI bus, serial, CANbus, Ethernet	serial, CANbus, Ethernet	serial, CANbus, Ethernet
On-board amplifier voltage range	N/A	N/A	N/A	12-56V
On-board amplifier max current, continuous	N/A	N/A	N/A	Brushless DC Motor: 10 Arms, Step motor: 9 Arms, DC Brush Motor: 14 ADC
Dimensions	4.35" x 3.78" x 0.6" (11.1cm x 9.6cm x 1.5cm)	5.8" x 4.20" x 0.58" (14.7cm x 10.7cm x 1.5cm)	6.30" x 4.23" x .8" (16.0cm x 10.7cm x 2.0cm)	7.80" x 4.88" x .78" (19.8cm x 12.4cm x 1.98cm)

Development Tools

1 EASY START-UP Developers Kit

Includes

- Prodigy Developer's Kit board
- Pro-Motion CD and User's Guide
- Development software CD with C-Motion and VB-Motion software
- Complete manual set
- Complete cable & prototyping connector set



2 TUNE & OPTIMIZE Pro-Motion® GUI

Pro-Motion is a sophisticated, easy-to-use Windows-based exerciser program for use with PMD motion control ICs, modules, and boards.

Features

- Motion oscilloscope graphically displays processor parameters in real-time
- Autotuning
- Ability to save and load settings
- Axis wizard
- Distance and time units conversion
- Motor-specific parameter setup
- Axis shuttle performs programmable motion between two positions
- Communications monitor echoes all commands sent by Pro-Motion to the board
- Advanced Bode analysis for frequency machine response

3 BUILD THE APP C-Motion®

C-Motion is a complete, easy-to-use, motion programming language that includes a source library containing all the code required for communicating with PMD motion ICs, board, and modules.

C-Motion features include:

- Extensive library of commands for virtually all motion design needs
- Develop embeddable C/C++ applications
- Complete, functional examples
- Supports serial, CAN, Ethernet, and SPI communications

```
code for executing a profile and tracking
captured in this example could be used for tuning the Pro
trace buffer wrap mode to a one time trace
TraceMode(hAxis1, PMDTraceOneTime);

// set the processor variables that we want to capture
SetTraceVariable(hAxis1, PMDTraceVariable1, PMDAxis1,
SetTraceVariable(hAxis1, PMDTraceVariable2, PMDAxis1,
SetTraceVariable(hAxis1, PMDTraceVariable3, PMDAxis1, P
// set the trace to begin when we issue the next update command
SetTraceStart(hAxis1, PMDTraceConditionNextUpdate);
// set the trace to stop when the MotionComplete event occurs
SetTraceStop(hAxis1, PMDTraceConditionEventStatus,
PMDEventMotionCompleteBit, PMDTraceStateHigh);
SetProfileMode(hAxis1, PMDTrapezoidalProfile);

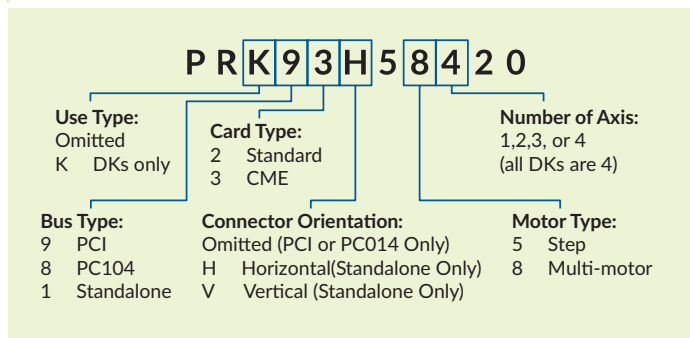
// set the profile parameters
SetPosition(hAxis1, 200000);
SetVelocity(hAxis1, 0x200000);
SetAcceleration(hAxis1, 0x1000);
SetDeceleration(hAxis1, 0x1000);

// set the motion
Motion(hAxis1);
```

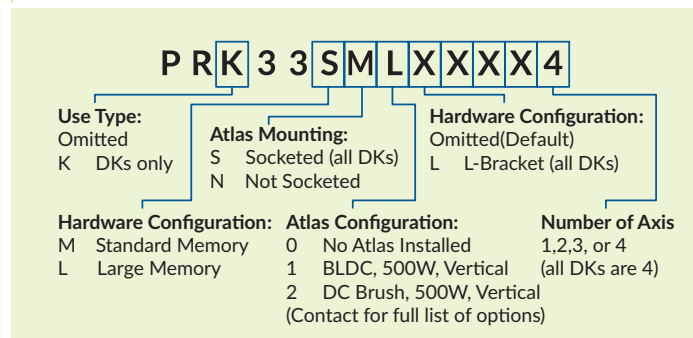
> PMD PRODUCT OVERVIEW

	VELOCITY & TORQUE CONTROL ICs	MAGELLAN® MOTION CONTROL ICs	ATLAS® DIGITAL AMPLIFIERS	PRODIGY® MOTION BOARDS	ION® DIGITAL DRIVES
					
No. Axes	1	1, 2, 3, 4	1	1, 2, 3, 4	1
Format	<ul style="list-style-type: none"> • 64-pin TQFP 	<ul style="list-style-type: none"> • 144-pin TQFP • 100-pin TQFP 	<ul style="list-style-type: none"> • Compact: 20-pin solderable module • Ultra Compact: 19-pin solderable module 	<ul style="list-style-type: none"> • PCI • PC/104 • Standalone • Machine Controller 	<ul style="list-style-type: none"> • Fully enclosed module
Voltage	3.3 V	3.3 V	12 - 56 V	PCI, PC/104, Standalone: 5 V Machine Controller: 12 - 56 V	12 - 56 V / 20 - 195 V
Features	<ul style="list-style-type: none"> • Velocity control • Commutation • Torque/current control • Field-oriented control 	<ul style="list-style-type: none"> • Position control • Commutation • Network communications • Torque/current control • Field oriented control • Profile generation • Multi-motor support 	<ul style="list-style-type: none"> • Torque/current control • Field oriented control • Trace buffer • Pulse & direction input • Multi-motor support • SPI Interface • MOSFET amplifier 	<ul style="list-style-type: none"> • Position control • Commutation • Network communications • Torque/current control • Field oriented control • Profile generation • Multi-motor support • PWM output • Analog output • Trace buffer • Programmable • Signal conditioning • General purpose user I/Os 	<ul style="list-style-type: none"> • Position control • Commutation • Network communications • Torque/current control • Field oriented control • Profile generation • Trace buffer • MOSFET amplifier • Pulse & direction input • Programmable (ION/CME only) • General purpose user I/Os (ION/CME only)
Motor Types	<ul style="list-style-type: none"> • Brushless DC 	<ul style="list-style-type: none"> • DC brush • Brushless DC • Step Motor 	<ul style="list-style-type: none"> • DC brush • Brushless DC • Step Motor 	<ul style="list-style-type: none"> • DC brush • Brushless DC • Step Motor 	<ul style="list-style-type: none"> • DC brush • Brushless DC • Step Motor
Communication	<ul style="list-style-type: none"> • Standalone • RS232/485 	<ul style="list-style-type: none"> • Parallel • RS232/485 • CANbus • SPI 	<ul style="list-style-type: none"> • SPI 	<ul style="list-style-type: none"> • Ethernet • RS232/485 • CANbus • PCI and PC/104 bus 	<ul style="list-style-type: none"> • Ethernet • RS232/485 • CANbus
Loop Rate	20 kHz – current 10 kHz – velocity	50 – 75 µsec/axis	20 kHz – current	50 – 150 µsec/axis	20 kHz – current 10 kHz – position

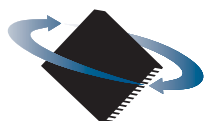
> FOR ORDERING PCI, PC/104 OR STANDALONE VERSIONS



> FOR ORDERING MACHINE CONTROLLER VERSION



To place an order or for additional information and questions, contact PMD customer support



**PERFORMANCE
MOTION DEVICES**
MOTION CONTROL AT ITS CORE

1 Technology park Dr, Westford, MA 01886
Tel: 978.266.1210 Fax: 978.266.1211
e-mail: info@pmdcorp.com
www.pmdcorp.com

About Performance Motion Devices

Performance Motion Devices (PMD) is a worldwide leader in motion control ICs, boards and modules. Dedicated to providing cost-effective, high performance motion systems to OEM customers, PMD utilizes extensive in-house expertise to minimize time-to-market and maximize customer satisfaction.

ATLAS, ION, Juno, Magellan, Navigator, Pilot, Prodigy, C-Motion and Pro-Motion are trademarks of Performance Motion Devices, Inc. All other trade names, brand names and company names are the property of their respective owners. 2017 Performance Motion Devices, Inc.