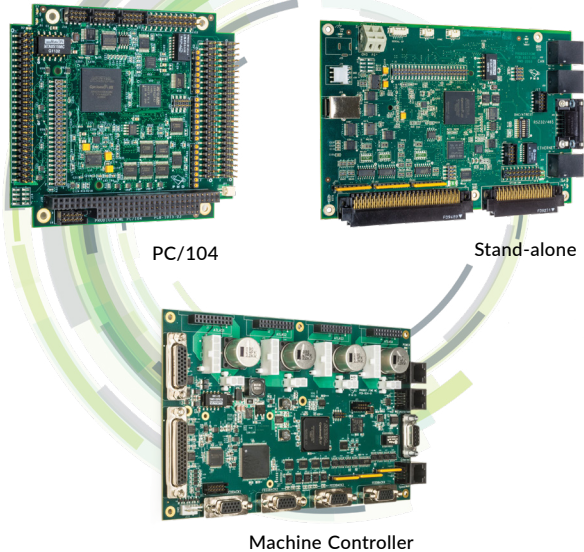


Prodigy[®] Motion Boards



Prodigy[®] Motion Boards provide high performance board-level motion control for scientific, automation, industrial, and robotic applications. Available in 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

CME versions of the board include PMD's C-Motion Engine that allows user application 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 amplifier.

Powerful and Easy to Use

Based on PMD's industry-leading Magellan[®] Motion Control IC, 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.

Built on the Magellan Motion Control IC

The Pro-Motion GUI makes it easy to set-up and analyze system parameters and motion performance. PMD's C-Motion library simplifies the program development process and allows the use of industry standard C/C++ or .NET programming languages.

FEATURES

- Uses PMD's advanced Magellan[®] Motion Control IC
- PC/104, Stand-alone, and Machine-controller configurations
- Available in 1, 2, 3, and 4-axis configurations
- Supports Brushless DC, step, and DC Brush motors
- S-curve, trapezoidal, electronic gearing, and velocity-contouring
- PC/104 (ISA), Ethernet, CANbus or serial communications
- Advanced PID filter with feedforward and dual biquad filters
- High speed loop rate: 50 μ sec/axis
- Up to 256 microsteps per full step resolution
- Incremental quadrature and Absolute SSI encoder support
- Includes Pro-Motion[®] and C-Motion[®] development software
- 6-step commutation and field oriented control modes
- High precision 16-bit DAC or PWM amplifier output
- General purpose digital I/O and analog I/O
- Two directional limit switches, plus high speed index, and home inputs per axis

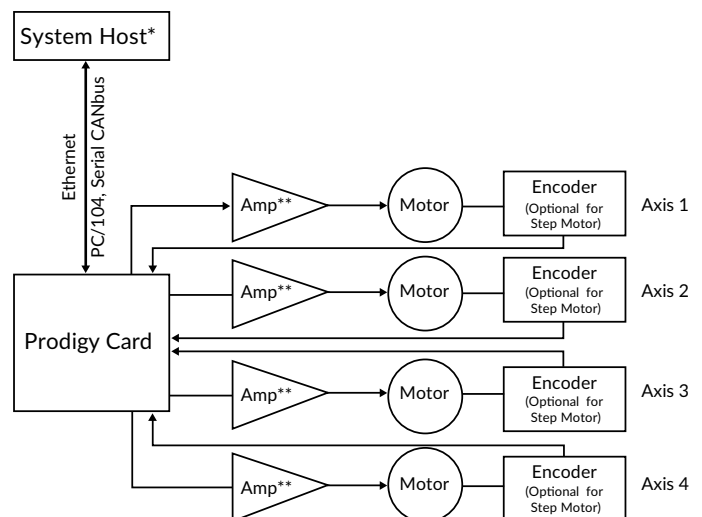
C-MOTION[®] ENGINE VERSIONS

- Board-level execution of C-Motion code
- Downloaded user application code runs at 96 MIPS
- C-Motion Engine development tools

MACHINE CONTROLLER VERSION

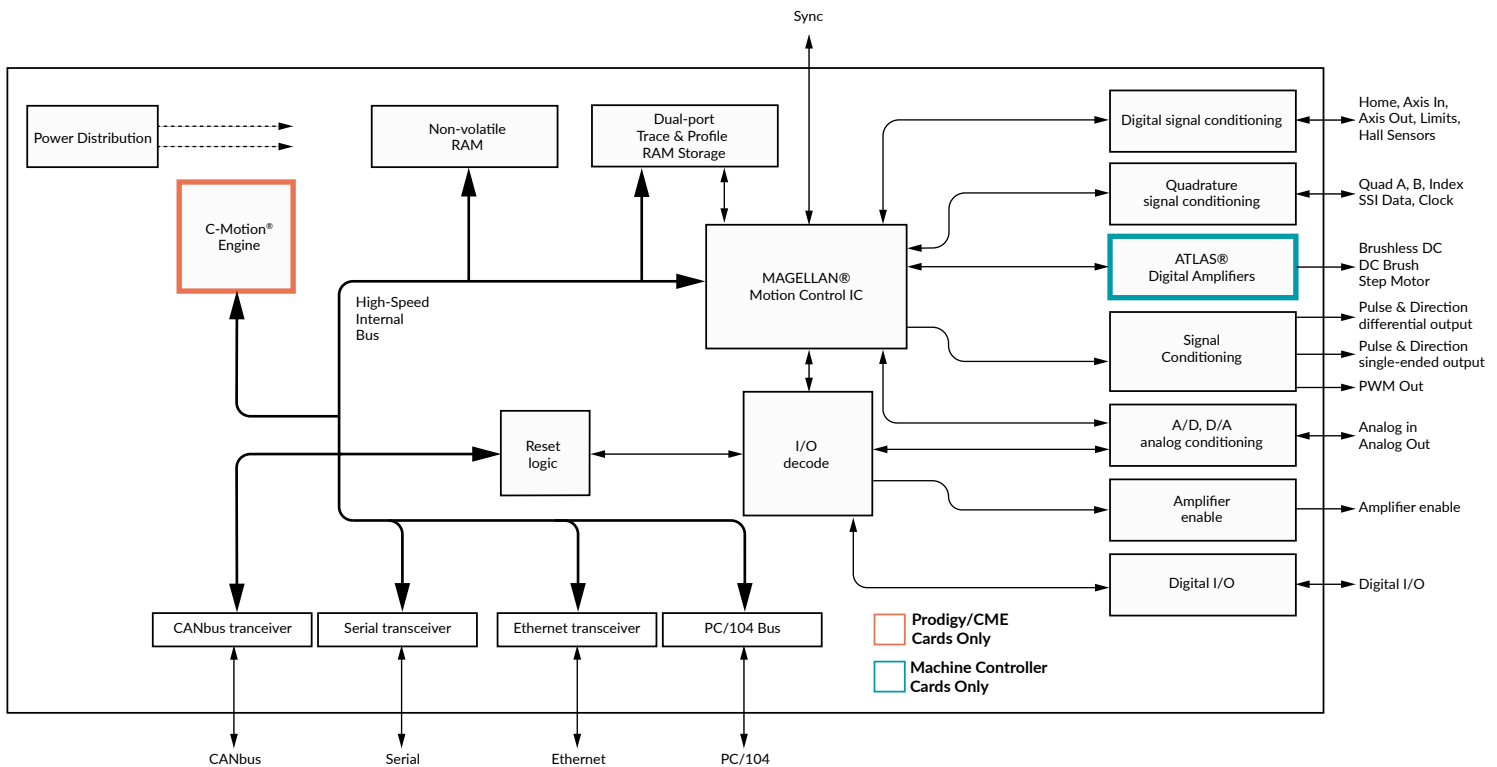
- On-board high performance Atlas amplifiers
- Extensive fault detection including over and undervoltage, motor short, and overtemp
- Up to 1KW peak output power per axis
- Single voltage supply drives motors and board logic

CONFIGURATION



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

Technical Overview



SPECIFICATIONS

	PC/104	Stand-alone	Machine Controller
Configurations	Standard or CME	CME	CME
Model	PR82 or PR83	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 μ sec 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	40 Mcounts/sec
Capability for onboard amplifier	No	No	Yes, Atlas Digital Amplifier
Motor output signals	Analog \pm 10V, PWM, pulse & direction	Analog \pm 10V, PWM, pulse & direction	Analog \pm 10V
General purpose digital I/O	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 16-bit channels (-10V to +10V)
General purpose analog outputs	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)	64KB	128K or 468K (enhanced memory option)
Communication modes	Standard: PC104 bus, serial, CANbus CME: PC104 bus, serial, CANbus, Ethernet	serial, CANbus, Ethernet	serial, CANbus, Ethernet
On-board amplifier voltage range	N/A	N/A	12-56V
On-board amplifier max current, continuous	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)	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 Kits
- Pro-Motion software
- Software Development Kit (SDK) with C-Motion
- Complete manual set
- Complete cable and prototyping connector set

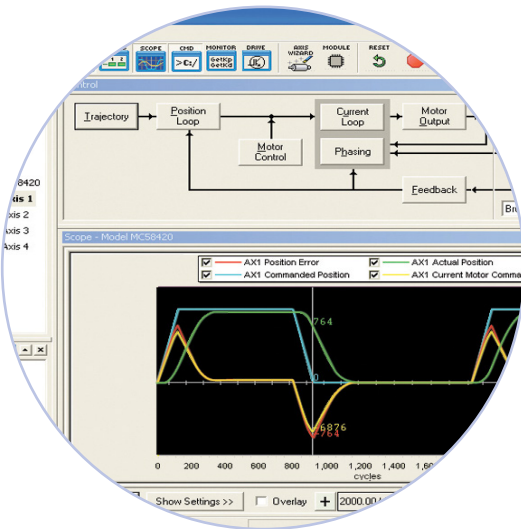


2 TUNE & OPTIMIZE Pro-Motion GUI®

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 PC/104, serial, CAN, Ethernet, and SPI communications

```
// code for executing a profile and tracing
// captured in this example could be used for tuning the Pro-Motion GUI

// set the trace buffer wrap mode to a one time trace
PMDTraceMode(hAxis1, PMDTraceOneTime);

// set the processor variables that we want to capture
SetTraceVariable(hAxis1, PMDTraceVariable1, PMDAxis1, PMDTraceVariable1);
SetTraceVariable(hAxis1, PMDTraceVariable2, PMDAxis1, PMDTraceVariable2);
SetTraceVariable(hAxis1, PMDTraceVariable3, PMDAxis1, PMDTraceVariable3);

// 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);

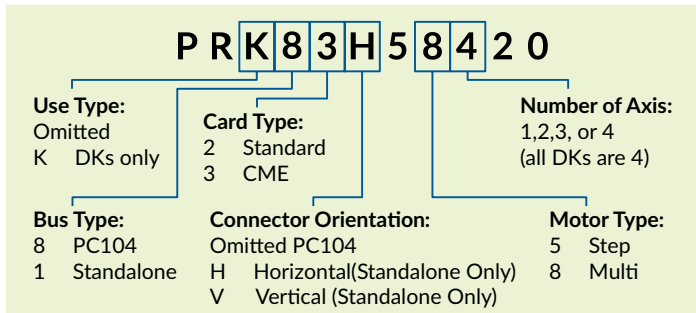
// execute the profile
PMDExecuteProfile(hAxis1);
```

PMD PRODUCT FAMILY OVERVIEW

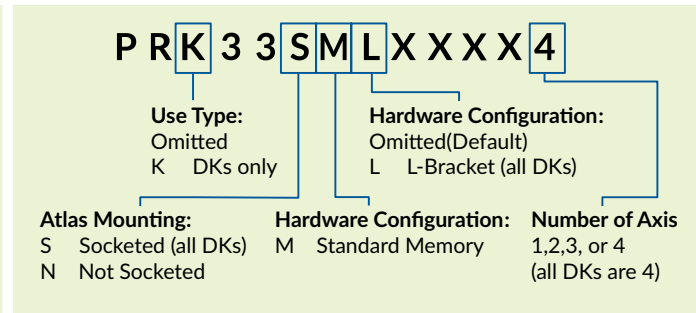
	# Axes	Motor Types	Format	Voltage	Communication	Features
JUNO® VELOCITY & TORQUE CONTROL ICs 	1	<ul style="list-style-type: none"> Brushless DC DC Brush Step Motor 	<ul style="list-style-type: none"> 64-pin TQFP 56-pin VQFN 	3.3 V	<ul style="list-style-type: none"> RS232/485 CANbus SPI 	<ul style="list-style-type: none"> Velocity control Current control Field oriented control
MAGELLAN® MOTION CONTROL ICs 	1,2,3,4	<ul style="list-style-type: none"> Brushless DC DC Brush Step Motor 	<ul style="list-style-type: none"> 144-pin TQFP 100-pin TQF 	3.3 V	<ul style="list-style-type: none"> RS232/485 CANbus SPI Parallel 	<ul style="list-style-type: none"> Position control Torque/current control Field oriented control Profile generation
ATLAS® DIGITAL AMPLIFIERS 	1	<ul style="list-style-type: none"> Brushless DC DC Brush Step Motor 	20-pin solderable module	12-56 V	<ul style="list-style-type: none"> SPI Pulse and direction 	<ul style="list-style-type: none"> Torque/current control Field oriented control MOSFET amplifier
ION®/CME N-SERIES DIGITAL DRIVES 	1	<ul style="list-style-type: none"> Brushless DC DC Brush Step Motor 	Fully enclosed PCB-mounted module	12-56 V	<ul style="list-style-type: none"> Ethernet RS232/485 CAN FD SPI 	<ul style="list-style-type: none"> Position control Torque/current control Field oriented control Profile generation MOSFET amplifier Downloadable user code
ION® 500 & 3000 DIGITAL DRIVES 	1	<ul style="list-style-type: none"> Brushless DC DC Brush Step Motor 	Fully enclosed cable-connected module	12-56 V 20-195 V	<ul style="list-style-type: none"> Ethernet RS232/485 CANbus 	<ul style="list-style-type: none"> Position control Torque/current control Field oriented control Profile generation MOSFET amplifier Downloadable user code
PRODIGY® MOTION BOARDS 	1,2,3,4	<ul style="list-style-type: none"> Brushless DC DC Brush Step Motor 	<ul style="list-style-type: none"> Machine Controller PC/104 Standalone 	<ul style="list-style-type: none"> 5 V: PC/104 and Standalone 12-56 V: Machine Controller 	<ul style="list-style-type: none"> Ethernet RS232/485 CANbus PC/104 bus 	<ul style="list-style-type: none"> Position control Torque/current control Field oriented control Profile generation Downloadable user code

C-Motion® is the common motion language for all Performance Motion Devices products.

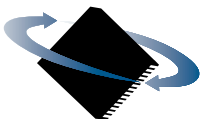
FOR ORDERING PC/104 OR STANDALONE VERSIONS



FOR ORDERING MACHINE CONTROLLER VERSIONS



To place an order email purchaseorders@pmdcorp.com. For questions email support@pmdcorp.com



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

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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.

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