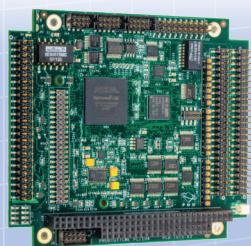
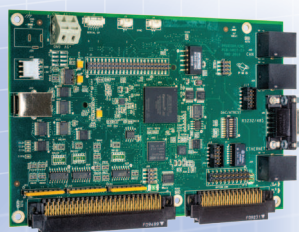


P M D PERFORMANCE **MOTION** DEVICES

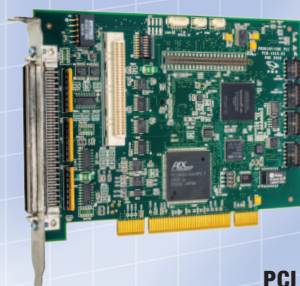
Prodigy[®] Motion Cards



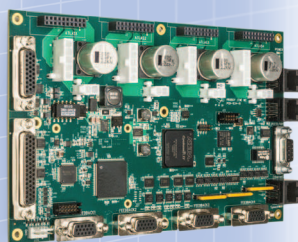
PC/104



Stand-alone



PCI



Machine Controller

Prodigy[®] Motion Cards

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 cards support multiple motor types including DC brush, brushless DC, and step motors, and are available in 1, 2, 3, and 4-axis configurations. Programmable versions of the card include PMD's C-Motion Engine that allows user code to run directly on the card, off-loading the system host or enabling stand-alone operation. The Machine controller version has on-card Atlas amplifiers that eliminate the need for external amplifiers along with enhanced analog and digital I/O.

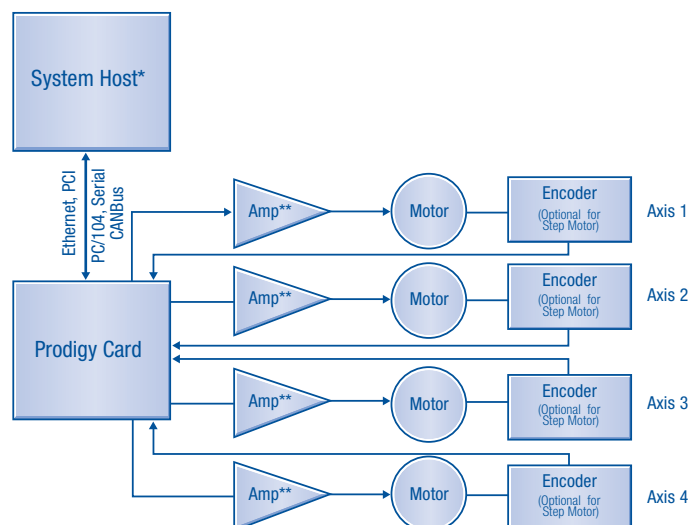
Based on PMD's industry-leading Magellan[®] Motion Processor, the Prodigy cards provide user-selectable profile modes including S-curve, trapezoidal, velocity contouring, and electronic gearing with on-the-fly parameter change. Servo loop compensation utilizes a full 32-bit position error, PID with velocity 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

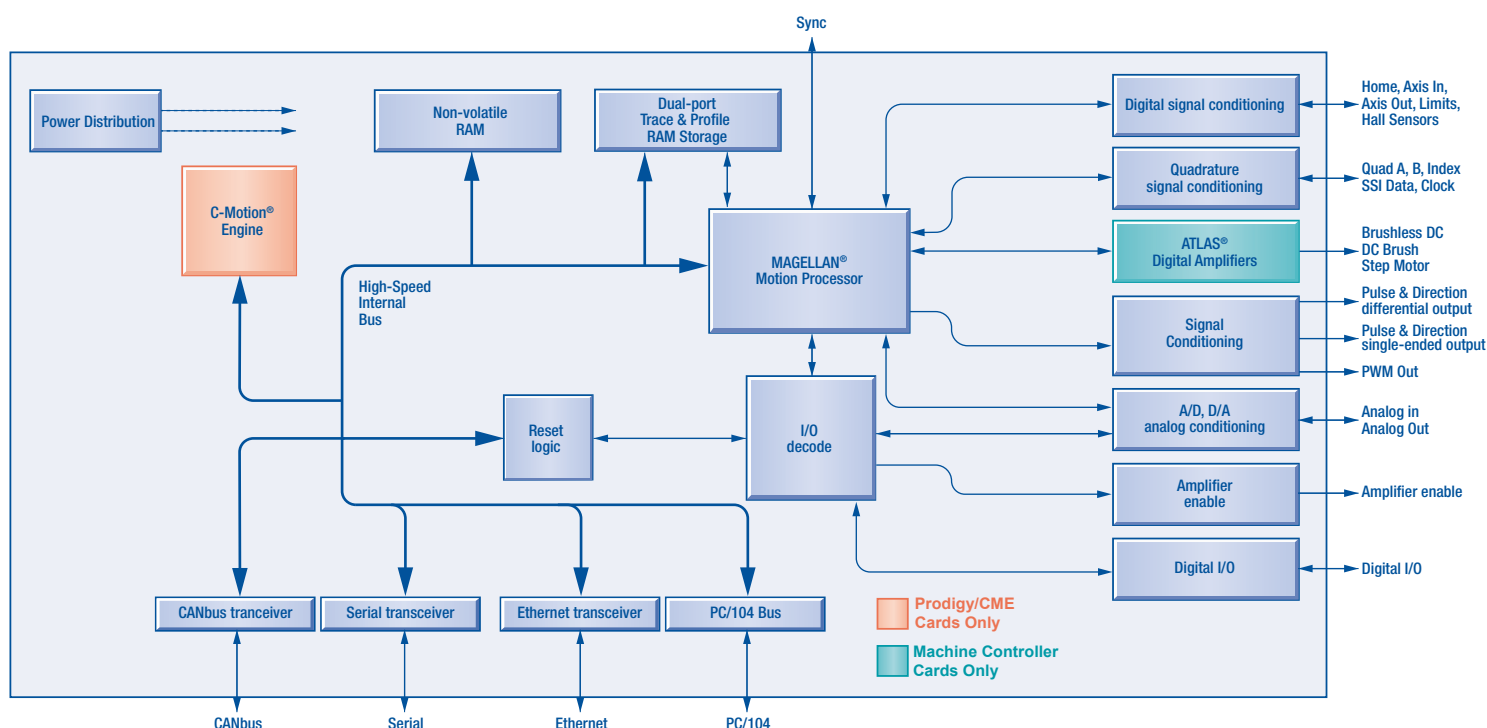
- Uses PMD's advanced Magellan[®] Motion Processor
 - PCI, PC/104, Stand-alone, and Machine-controller configurations
 - Available in 1, 2, 3, and 4-axis configurations
 - Supports DC brush, brushless DC, and step motors
 - S-curve, trapezoidal, electronic gearing, and velocity-contouring
 - PC/104 (ISA), PCI-bus, 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[®], C-Motion[®] and VB-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-card high performance Atlas amplifiers
 - Extensive fault detection including over & undervoltage, motor short, and overtemp
 - Up to 1KW peak output power per axis
 - Single voltage supply drives motors and card 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	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-card amplifier voltage range	N/A	N/A	N/A	12-56V
On-card amplifier max current, continuous	N/A	N/A	N/A	DC Brush Motor: 14 ADC, Brushless DC Motor: 10 Arms, Step motor: 9 Arms
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 & Accessories

> DEVELOPER'S KIT



Includes

- Ordered Prodigy card; either PCI, PC/104, Standalone or Machine controller card
- Pro-Motion CD and User's Guide
- Development software CD with C-Motion and VB-Motion software
- Complete manual set
- All required communications cables
- Stub cable set

> C-MOTION® SOFTWARE

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 processors, cards and ATLAS® Digital Amplifiers. C-Motion may be used to communicate with ATLAS Digital Amplifiers through a Magellan motion processor, either as part of a PMD card or a user-designed product.

C-Motion features include:

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

Example C-Motion code for executing a profile and tracing some processor variables

The information captured in this example could be used for tuning the PID filter.

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

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

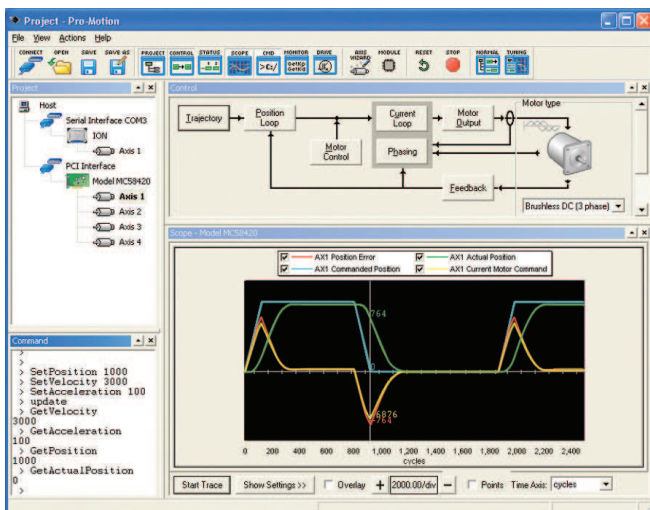
// set the trace to begin when we issue the next update command
SetTraceStart(hAxis1, PMDTraceConditionNextUpdate);

// 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);

// start the motion
Update(hAxis1);
```

> PRO-MOTION® GUI



Pro-Motion is a sophisticated, easy-to-use Windows-based exerciser program for use with the ATLAS Digital Amplifiers, ION Digital Drives and other PMD motion control ICs and cards.

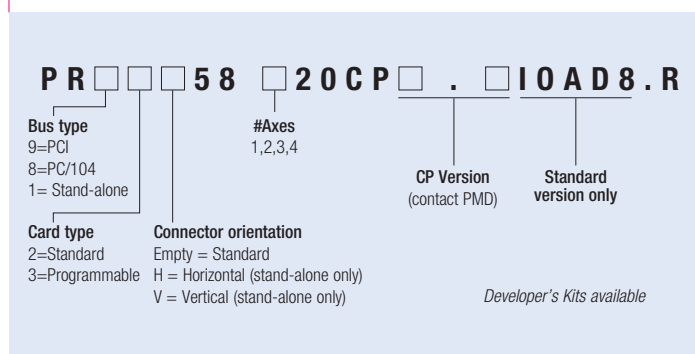
Features

- 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 continuous back and forth motion between two positions
- Communications monitor echoes all commands sent by Pro-Motion to the card

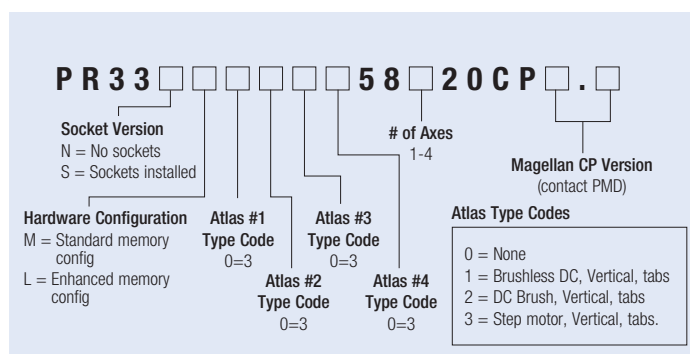
> PMD PRODUCT OVERVIEW

	MOTOR CONTROL IC 	MAGELLAN® MOTION PROCESSOR ICs 	ATLAS® DIGITAL AMPLIFIERS 	PRODIGY® MOTION CARDS 	ION® DIGITAL DRIVES 
No. Axes	1	1, 2, 3, 4	1	1, 2, 3, 4	1
Format	• 64-pin TQFP	• 144-pin TQFP • 100-pin TQFP	• 20-pin solderable module	• PCI • PC/104 • Standalone • Machine Controller	• 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
Function	• Velocity control • Torque/Current control • Commutation • Field-oriented control	• Position control • Profile generation • Commutation • Network communications • Multi-motor support	• Torque/Current Control • Field Oriented Control • Trace Buffer • Amplification • Pulse & Direction Input • SPI Interface • User Configuration Storage	• Position control • Profile generation • Commutation • Network communications • Signal conditioning • Multi-motor support • Analog output • PWM output • Trace buffer • Programmable • General purpose user I/Os	• Position control • Profile generation • Commutation • Network communications • Field oriented control • Torque/current control • Trace buffer • Amplification • Pulse & direction input • Programmable • General purpose user I/Os
Motor Types	• Brushless DC	• DC brush • Brushless DC • Step Motor	• DC brush • Brushless DC • Step Motor	• DC brush • Brushless DC • Step Motor	• DC brush • Brushless DC • Step Motor
Communication	• Standalone • RS232/485	• Parallel • RS232/485 • CANbus	• SPI	• PCI and PC/104 bus • Ethernet • RS232/485 • CANbus	• CANbus • Ethernet • RS232/485
Loop Rate	20 kHz – current 10 kHz – velocity	50 – 75 μ sec/axis	20 kHz – current	50 – 150 μ sec/axis	20 kHz – current 10 kHz – position

> FOR ORDERING PCI, PC/104 OR STANDALONE VERSIONS



> FOR ORDERING MACHINE CONTROLLER VERSION



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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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