DATASHEET

PERFORMANCE MOTION DEVICES
MOTION CONTROL AT ITS CORE

ATLAS® Digital Amplifiers

SCAN ME

ATLAS® Digital Amplifiers are compact single-axis amplifiers that provide high performance torque control for DC Brush, Brushless DC, and step motors. They are packaged in a compact, solderable module and are ideal for use in positioning motion control, velocity control, and precision force control applications.

High Performance in an Ultra Compact Package

ATLAS Digital Amplifiers are used for direct control of motor torque, or in conjunction with higher level motion controllers. Their very compact size and high power output make them ideally suited for applications such as medical equipment, laboratory automation, scientific instruments, general purpose motion control, force feedback, and actuator controls. ATLAS Amplifiers are provided in vertical and horizontal mounting configurations, with three power levels, and two package sizes.

Advanced Amplifier Technology

ATLAS Digital Amplifiers utilize PMD's proprietary digital current control and switching technology for exceptional efficiency and quiet motor operation. Control features include user-programmable gain parameters, performance trace, field oriented control, and I2t current management. Atlas amplifiers are internally powered from a single motor supply voltage, and provide automatic protection from overcurrent, undervoltage, overvoltage, overtemperature, and short circuit faults.

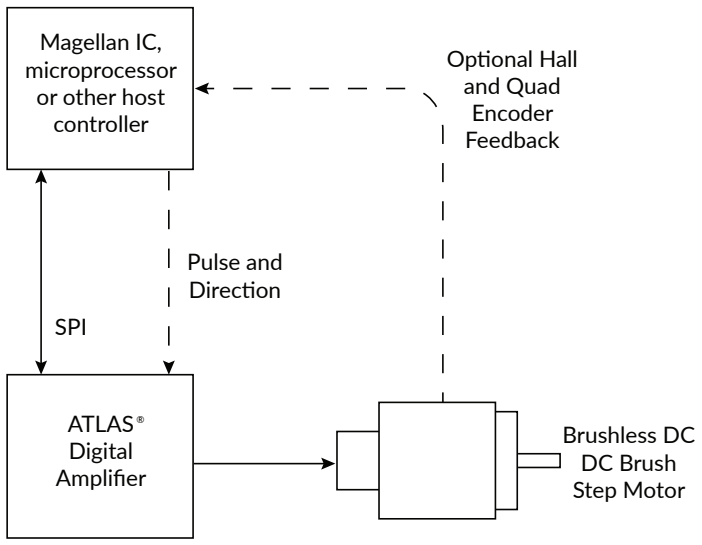
Easy to Use

The ATLAS family has been designed to work seamlessly with PMD's Magellan motion control ICs. Alternatively, they can be used with dedicated FPGAs, digital signal processors, or general purpose microprocessors. Communication is via SPI (Serial Peripheral Interface) using a simple, packet-oriented protocol. For step motors, in addition to the SPI format a pulse and direction input mode is provided.

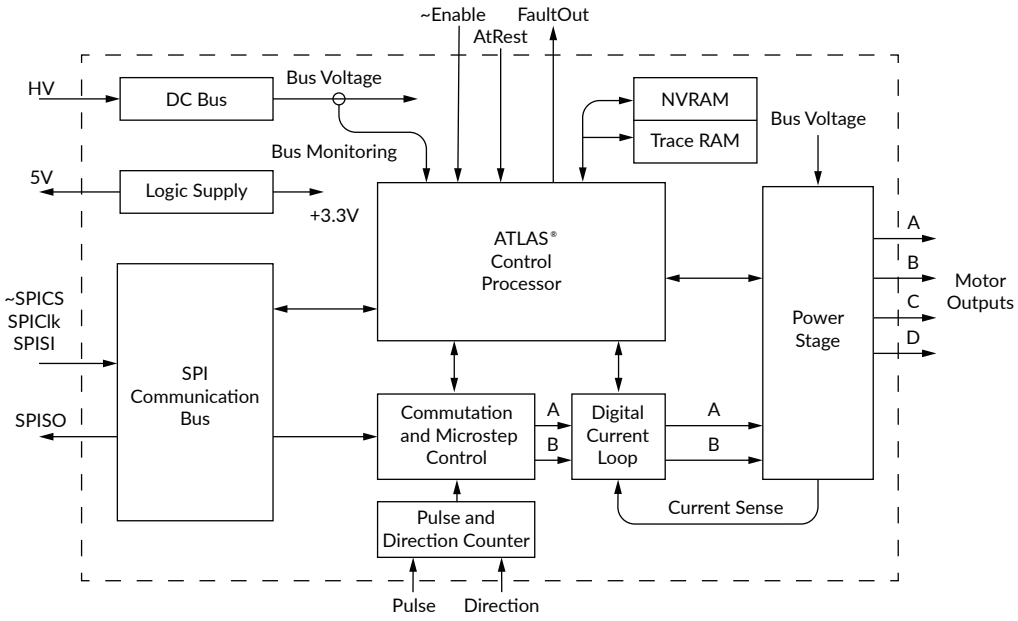
FEATURES

- Ultra efficient all digital solderable power amplifier
- Controls Brushless DC, step, and DC Brush motors
- Available in 75 W, 250 W, and 500 W power levels
- Operating supply voltage range of 12 V to 56 V
- Field oriented control
- Overcurrent, overvoltage, and undervoltage protection
- Single supply operation from motor bus voltage
- Fully digital current control
- I2t current foldback limiting
- On-board performance trace and motor parameter storage in NVRAM
- Multi-motor version allows motor type to be programmed by user
- SPI (Serial Peripheral Interface) eliminates analog +/- 10 V torque signals
- Pulse and direction input for step motor operation
- Internal temperature monitor
- Two different package sizes available
- Enable input and Fault output safety interlocks
- Works with Magellan® ICs, FPGAs or microprocessor-based controllers
- Comes in horizontal and vertical mount configurations
- Digital SPI torque command with checksum
- Industry leading efficiency and power density
- Full RoHS compliant and CE marked
- Up to 14A continuous, 25A peak motor output
- User programmable current loop gain values

CONFIGURATION

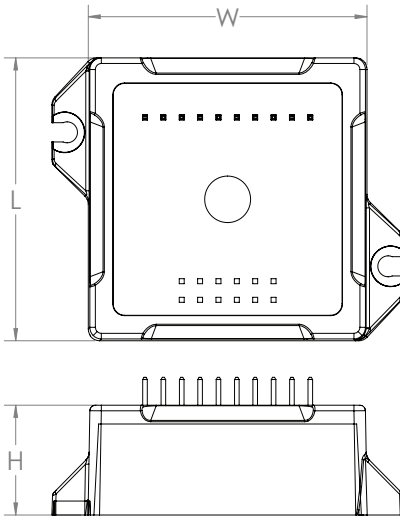


Technical Overview

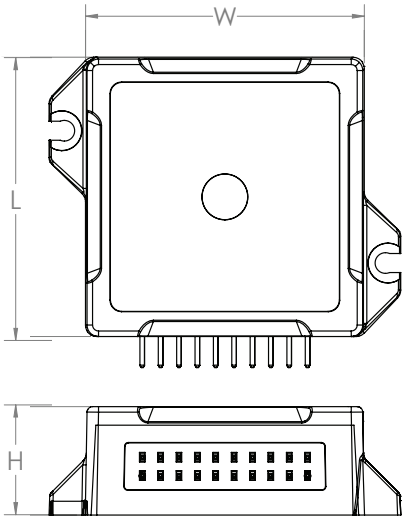


MECHANICAL DIMENSIONS

Horizontal Configuration



Vertical Configuration



ATLAS FAMILY SPECIFICATIONS

Parameter	Value
Supported Motor Types	Brushless DC, step motor, DC Brush, and multi-motor
PWM frequency	20, 40, 80, 120 kHz
Current Loop rate	20 kHz
Microstepping resolution	256 microsteps per full step
User Programmability:	Non-volatile RAM user configuration storage
Trace Memory:	2 KB
I/Os:	FaultOut, Enable
Safety:	Short Circuit, OverCurrent, I^2t Current Foldback, SPI Watchdog, Overvoltage, Undervoltage
Operating Temperature:	0° - 40° C
Compliance:	RoHs, CE LVD:EN60204-1, EMC-D: EN61000-6-1, EN61000-6-3, EN55011
UL:	Designed to UL508C, UL840, and EN60204-1

ATLAS MODELS SPECIFICATIONS

Model	Voltage Input	Peak Current	Continuous Current	Package
Low Power, brushless DC	12-48V	3.8 Amps	1.5 Arms	Ultra Compact
Low Power, step motor	12-48V	3.8 Amps	1.5 Arms	Ultra Compact
Low Power, DC brush	12-48V	3.8 Amps	1.5 ADC	Ultra Compact
Medium Power, brushless DC	12-48V	12.5 Amps	5.0 Arms	Ultra Compact
Medium Power, step motor	12-48V	12.5 Amps	4.5 Arms	Ultra Compact
Medium Power, DC brush	12-48V	12.5 Amps	7.0 ADC	Ultra Compact
High Power, brushless DC	12-56V	25.0 Amps	10.0 Arms	Compact
High Power, step motor	12-56V	25.0 Amps	9.0 Arms	Compact
High Power, DC brush	12-56V	25.0 Amps	14.0 ADC	Compact

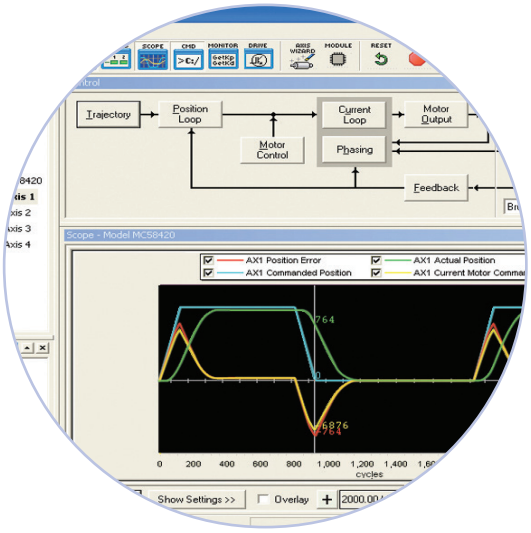
Model	Length (L)	Width (W)	Height (H)
Ultra Compact Vertical	1.054 (in) 26.8 (mm)	1.051 (in) 26.7 (mm)	0.526 (in) 13.4 (mm)
Ultra Compact Horizontal	1.054 (in) 26.8 (mm)	1.051 (in) 26.7 (mm)	0.526 (in) 13.4 (mm)
Compact Vertical	1.520 (in) 38.6 (mm)	1.517 (in) 38.5 (mm)	0.600 (in) 15.2 (mm)
Compact Horizontal	1.520 (in) 38.6 (mm)	1.517 (in) 38.5 (mm)	0.600 (in) 15.2 (mm)

Development Tools

1 EASY START-UP
Developers Kit

INCLUDES

- 1 or 4 axis configuration supports all Atlas unit types
- Pro-Motion software
- Includes rugged L-bracket hardware
- Complete manual set
- Complete cable and prototyping connector set



2 TUNE & CONFIGURE
Pro-Motion® GUI

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

FEATURES

- Motion oscilloscope graphically displays parameters in real-time
- Autotuning of control parameters
- Ability to save and load configuration parameters in NVRAM
- Easy motor setup with Axis wizard
- Advanced Bode frequency machine analysis
- Trace capability for analizing motor behavior

3 BUILD THE APPLICATION
C-Motion®

Atlas Developer Kits are most often used in conjuction with either the DK58420 or the DK58113 Magellan IC Developer Kits.

C-MOTION & MAGELLAN IC DEVELOPER'S KIT FEATURES

- Develop embeddable C/C++ application code
- Connects to encoder feedback signals, limit switches, and other motion peripherals
- Control and exercise your entire machine
- Communicate to the PC via PC/104, serial, CAN, or SPI communications
- Store NVRAM parameters

```
// code for executing a profile and tracing
// captured in this example could be used for tuning the PID
// 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
tPosition(hAxis1, 200000);
Velocity(hAxis1, 0x200000);
celeration(hAxis1, 0x1000);
leration(hAxis1, 0x1000);
tion
```

PMD PRODUCT FAMILY OVERVIEW

	# Axes	Motor Types	Format	Voltage	Communication	Features
JUNO® VELOCITY & TORQUE CONTROL ICS	1	• Brushless DC • DC Brush • Step Motor	• 64-pin TQFP • 56-pin VQFN	3.3 V	• RS232/485 • CANbus • SPI	• Velocity control • Current control • Field oriented control
MAGELLAN® MOTION CONTROL ICS	1,2,3,4	• Brushless DC • DC Brush • Step Motor	• 144-pin TQFP • 100-pin TQF	3.3 V	• RS232/485 • CANbus • SPI • Parallel	• Position control • Torque/current control • Field oriented control • Profile generation
ATLAS® DIGITAL AMPLIFIERS	1	• Brushless DC • DC Brush • Step Motor	• 20-pin solderable module	12-56 V	• SPI • Pulse and direction	• Torque/current control • Field oriented control • MOSFET amplifier
ION®/CME N-SERIES DIGITAL DRIVES	1	• Brushless DC • DC Brush • Step Motor	• Fully enclosed PCB-mounted module	12-56 V	• Ethernet • RS232/485 • CAN FD • SPI	• Position control • Torque/current control • Field oriented control • Profile generation • MOSFET amplifier • Downloadable user code
ION® 500 & 3000 DIGITAL DRIVES	1	• Brushless DC • DC Brush • Step Motor	• Fully enclosed cable-connected module	12-56 V 20-195 V	• Ethernet • RS232/485 • CANbus	• Position control • Torque/current control • Field oriented control • Profile generation • MOSFET amplifier • Downloadable user code
PRODIGY® MOTION BOARDS	1,2,3,4	• Brushless DC • DC Brush • Step Motor	• Machine Controller • PC/104 • Standalone	• 5 V: PC/104 and Standalone • 12-56 V: Machine Controller	• Ethernet • RS232/485 • CANbus • PC/104 bus	• 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 ATLAS

MD 1 3 1 056/25 HB

Atlas Body Type:
1 Compact
2 Ultra Compact

# of Axis:
1 Default

Motor Type:
1 DC Brush
3 BLDC
4 Step
8 Multi-motor

Power Selection:
056/25 Atlas 500W
048/05 Atlas 250W
048/02 Atlas 75W

Atlas Mounting:
VB Vertical
HB Horizontal

FOR ORDERING ATLAS DKS

MDK 1 LI0000 H

# of Axis:
1 or 4

Atlas Mounting:
V Vertical
H Horizontal

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 amplifiers. 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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