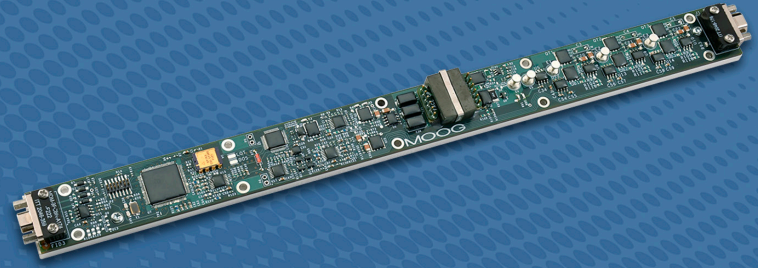


# DOWNHOLE MOTOR CONTROLLER

Ruggedized design built to reliably operate in the most extreme environments



## HIGH PERFORMANCE MOTOR CONTROLLER IN A COMPACT PACKAGE

Moog is a leader in motion control technology and has provided innovative products and solutions for a wide range of industries for more than 65 years, including 35 years serving the oil & gas industry. We meet our customers' needs through ruggedized products and by delivering fast, responsive global support.

The Moog Downhole Motor Controller is designed for high performance, high temperature environments such as downhole drilling which demand exceptionally narrow package diameters. The single axis controller is a closed loop control solution for velocity and position control that complements our Downhole Brushless Servo Motors and Servo Actuators. A low current draw in standby mode maximizes operating time in battery powered applications.

For a complete solution, the software and graphical user interface (GUI) are engineered to expedite the design and test of your product while providing the flexibility to support your application specific requirements. Diagnostic data, accessible via the RS485 serial interface, provides health/life monitoring based on time and temperature in operation.

Features	Benefits
Single PCB design combines both control and power electronics	Lowers cost and footprint by eliminating board to board connectors
Optimized design for high temperature extreme environments	Reliable operation at high temperature for 1000 hrs and avoidance of unexpected equipment failure
Sinusoidal field-oriented control with Resolver feedback	High efficiency, smooth torque control and extended motor speed capability
Six Step Commutation with Hall sensor feedback (optional model)	Support for BLDC motors with hall sensors
Easy to use GUI with built in oscilloscope data logger	Simplified commissioning and troubleshooting of drive system
One inch wide package	Fits in compact diameter downhole tools

## ADVANTAGES

- Tested with Moog downhole motors and actuators to provide a complete motion control solution
- User friendly GUI tools:
  - Data Logging & Oscilloscope up to 4 channels
  - Editable Parameter Database
  - Status and Fault Indication
  - Function Generator
  - Event Logger

## APPLICATIONS

- MWD/LWD
- Rotary Steerable Tools
- Completion Tools
- Tractor Tools
- Pump Applications/Control
- Formation Testing

## MOOG GLOBAL SUPPORT

Moog Global Support is our promise to offer world-class Repair and Maintenance Services with the reliability only available from a leading manufacturer with facilities around the world. Count on Moog to keep your equipment operating as it should.



# SPECIFICATIONS

GENERAL INFORMATION	
<b>Envelope</b>	
Controller Board and Bottom Frame	25.4mm (1") wide by 300mm (11.8") long by 17mm (0.7") high
<b>Electrical Connections</b>	
Command Input / Motor Feedback	9 pin Micro MDM connector / 9 pin Micro MDM connector
DC Power Input / Motor Phase Output	Flying Leads / Flying Leads
<b>ELECTRICAL RATINGS</b>	
<b>Bus Voltage Min / Max</b>	16 / 60 VDC - 28 VDC Nominal
<b>Motor Phase Current Continuous / Peak</b>	1 Amp (Sine rms) / 2 Amp (Sine rms, 2 sec limit)
<b>SERIAL INTERFACE (GUI / PARAMETERS / DIAGNOSTICS)</b>	
<b>Protocol / Hardware Interface</b>	Modbus (Down Hole Variant) / RS485 - 57.6 Kbits/s
<b>CONTROL INPUT / OUTPUT</b>	
<b>Input Command</b> (Velocity, Current or Position)	0-5V analog input, internal function generator, application specific motion profile (option)
<b>Digital Inputs (2)</b> (Enable, Run default functions)	5V Logic compatible, configurable function
<b>Digital Outputs (2)</b> (Ready, Fault default functions)	5V Logic compatible Active pullup, configurable function
<b>SERVO CONTROL (STANDARD)</b>	
<b>Motor Control Architecture</b>	Field Oriented Control with Space Vector Modulation
<b>Motor Commutation Feedback</b>	
Resolver Excitation Voltage / Current	7.2Vpp @ 11kHz / 20mA
Resolver Feedback Transformation Ratio	0.5
<b>SIX-STEP CONTROL (OPTIONAL)</b>	
<b>Motor Control Architecture</b>	Six Step Control with high side PWM
<b>Motor Commutation Feedback</b>	
Hall Sensor Excitation Voltage / Current	5V / 50mA
<b>DIAGNOSTICS AND FAULT CONTROL</b>	
<b>Controller Temperature Protection</b>	Configurable as Monitor only or Fault Trip
<b>Motor Temperature Protection</b>	RTD Input, configurable as Monitor only or Fault Trip
<b>Current Protection</b>	
Motor Stall Detection	2A Sine rms for 2 sec configurable
Motor Phase Current Limit	1A Sine rms configurable as Foldback or Monitor only
Short Circuit Overcurrent Trip	5 Amp Shoot-thru, Phase-Phase, Phase-Ground
<b>Bus Overvoltage Trip</b>	Programmable Trip up to 65V non-latching
<b>Bus Undervoltage Inhibit</b>	16V
<b>Motor Overspeed Protection</b>	Programmable Overspeed Trip Point
<b>ENVIRONMENT</b>	
<b>Temperature</b>	
Operation Range	1000 hours @ 175° C
<b>Shock</b>	250G, 1ms ½ sine wave all three axes
<b>Vibration</b>	20G rms Random, 50-500Hz all three axes

Moog has offices around the world. For more information on Oil & Gas Solutions visit our website our find the office nearest you at:

[www.moog.com/industrial](http://www.moog.com/industrial)

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