Stepper Motor Control Board

Ordering Information

Order No.	Description
MDL-STEPPER	Stellaris® Stepper Motor Control Board Only
RDK-STEPPER	Stellaris® Stepper Motor Control Reference Design Kit (includes MDL-STEPPER board)

Contents

General Description **1**
Overview 1
General Features 2
Communications Features 2
Operational Specifications **2**
Mechanical **3**
Additional Information **3**

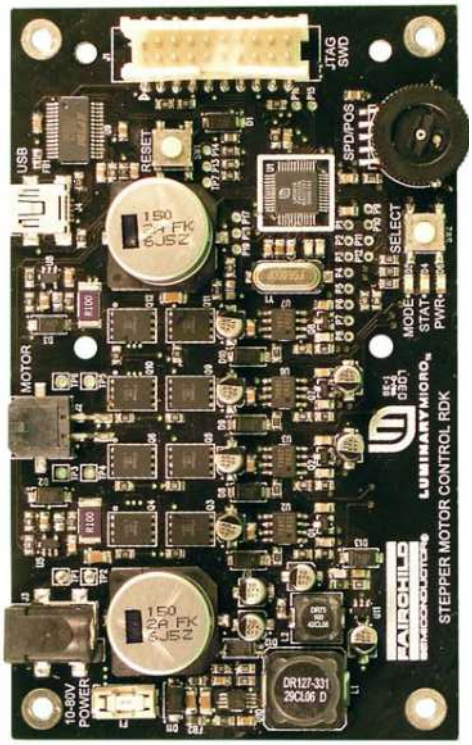

Figure 1. Stepper Motor Control Board

General Description

The stepper motor control board is a sophisticated motor control for driving NEMA17, NEMA23, and NEMA34 stepper motors rated at up to 80 V at 3 A. Key features include the feature-rich Stellaris LM3S617 microcontroller designed for motion control applications, a Fairchild Semiconductor power stage consisting of Fairchild's FAN73832 HVIC Driver and FDMS3672 MOSFET, and sophisticated software to optimally control a wide range of motors in diverse applications.

First-time users should purchase the Stepper Motor Reference Design Kit (RDK) which includes the control board, cables, configuration software (GUI), a documentation CD, and a sample motor. After evaluating the Stepper Motor control board, users may choose to either customize the design or use the Stepper motor control board without modification. Refer to the *RDK-STEPPER User's Guide* (available for download from www.luminarymicro.com) for complete technical details on using and customizing the motor control board. The Stepper board includes the Stellaris motor control and configuration (MCC) protocol. This protocol can be replaced with any industry-standard protocol.

Overview

The MDL-STEPPER motor control board provides the following features:

- Controls stepper motors up to 80 V at 3 A

- Supports NEMA17, NEMA23, and NEMA34 type stepper motors
- Advanced chopper control of bipolar stepper motors
- High step rates up to 10,000 steps/sec (with suitable motor)
- Microstepping
- Flexible platform accelerates integration process
- Programmable holding current
- Extensive configuration options using Windows Graphical User Interface (GUI)
- Easy to customize—full source code and design files included

General Features

- Integrated USB Virtual COM port
- Boot loader for firmware upgrades over serial port
- Support for external debugger through standard 20-pin ARM header
- Test mode push-button and potentiometer
- Status LEDs indicate Power, Status, and Mode
- Screw terminals for all power and signal wiring

Communications Features

- USB/Serial UART
  - FTDI FT232R USB to serial UART
  - Virtual COM port, 115.2k,8,n,1 operation
  - Stellaris MCC Protocol

Operational Specifications

Table 1 shows the operating parameters for the MDL-STEPPER motor control board.

Table 1. MDL-STEPPER Operating Specifications

Parameter Name	Min	Nom	Max	Unit
Power Supply	9	–	80	V DC
Speed Range[a]	1	–	10,000	steps/sec
Operating Temperature Range	0	–	70	°C
Storage Temperature Range	-25	–	85	°C
Motor Current (rated current per coil)	–	–	3	A
Motor Voltage (continuous coil voltage)	1	–	80	V DC

a. Actual range depends on motor type

TEXAS INSTRUMENTS

Mechanical

The following list provides the mechanical specifications for the MDL-STEPPER:

- PCB size: 4.6" x 2.8" x 0.75" (117 mm x 71 mm x 19 mm)
- No heat sink necessary
- Motor connector on PCB
  - Molex part # 43045-0409
  - 3.00 mm (0.118”) Pitch Micro-Fit 3.0™ Header, Surface Mount, Dual Row, Right Angle, with Solder Tab, 4 Circuits, Tin (Sn) Plating
- Mating connector for motor connector (above)
  - Molex part #43025-0400
  - 3.00 mm (0.118") Pitch Micro-Fit 3.0™ Receptacle Housing, Dual Row, 4 Circuits
  - DC power connector 2.1 mm ID, 2.5 mm OD

Additional Information

The following documents are available for download at www.luminarymicro.com:

- *RDK-STEPPER User’s Manual*, Publication Number RDK-STEPPER-UM
- *RDK-STEPPER Quickstart*

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