Stellaris® Brushed DC Motor Control Module with CAN (MDL-BDC24)
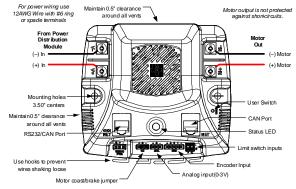
The Stellaris® Brushed DC Motor Control Module with CAN (MDL-BDC24) improves on the highly successful MDL-BDC design by providing variable speed control for both 12 V and 24 V brushed DC motors at up to 40 A continuous current, while adding a new RS232-based serial control input that also functions as a serial-to-CAN bridge. The MDL-BDC24 includes a rich set of sensor interfaces, connectivity, and control options, including analog and quadrature encoder interfaces, high performance Controller Area Network (CAN) interfaces, and an RS232 port. The module uses highly optimized software and a powerful 32-bit Stellaris® microcontroller to implement open-loop voltage control as well as closed-loop control of speed, position, or motor current. The H-bridge on the MDL-BDC24 is run at high-frequency through the MCU's integrated PWM interface and enables DC motors to run smoothly and quietly over a wide speed range.

The MDL-BDC24 is powered by the ARM® Cortex™-M3-based LM3S2616 microcontroller that provides efficient and deterministic performance while integrating CAN, UART, and advanced motion control capabilities. TheMDL-BDC24 design also incorporates several high-quality analog components from Texas Instruments, including the SN65HVD1050 CAN Transceiver, MAX3221 RS232 Line Driver/Receiver, TPS54040 Swift DC/DC Converter, TPS73633 Voltage Regulator, and INA193 Current Shunt Monitor. The MDL-BDC24 is positioned into a wide variety of consumer and industrial applications, including factory automation devices and systems, mobile robots, household appliances, pumping and ventilation systems, and electric wheelchairs and mobility devices.

Features

The MDL-BDC24 ships as a ready-to-run, yet customizable, module with the following features:

- Quiet control of brushed DC motors
  - 15 kHz Hbridge frequency
- Three options for open-loop voltage control
  - Industry-standard R-C servo type (PWM) interface
  - Controller Area Network (CAN) interface
  - RS232 serial interface
- Two options for closed-loop, speed, position, or current control
  - Controller Area Network (CAN) interface
  - RS232 serial interface
- CAN communication
  - Full configurability of module options
  - Real-time monitoring of current, voltage, speed, and other parameters
  - Load firmware over RS232/CAN
- RS232 serial communication
  - Bridges an RS232-enabled device to the CAN
  - Directly interfaces to a PC serial port or National Instruments cRIO
- Limit switch inputs for forward and reverse directions
- Firmware features
  - Full configurability of closed-loop module parameters
  - Real-time monitoring of sensor data including motor current, encoder position or speed, and limit switch state
- Status LED indicates run, direction, and fault conditions
- Motor brake/coast selector
- Quadrature encoder input (QEI) and analog input
- Color-coded screw terminals for all power wiring
- Easy to customize using tools supporting the MDL-BDC24 from Keil, IAR, Code Sourcery, or Code Red (using a Stellaris evaluation kit or preferred ARM® Cortex™-M3 debugger)

Ordering Information

Product Number	Description
MDL-BDC24	Stellaris® Brushed DC Motor Control Module with CAN (MDL-BDC24) for Single-Unit Packaging
MDL-BDC24-B	Stellaris® Brushed DC Motor Control Module with CAN (MDL-BDC24) for Volume Packaging

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