

Big Cat



By Jan Howells, ARM

The New Jaguar DC Motor Speed Controller from Luminary Micro is the New King of the Industrial Jungle

Jaguar Initially created to inspire young people's interest in science and technology. The 'Jaguar' Stellaris Brushed DC Motor Speed Controller (MDL-BDC) is now making waves in the industrial segment.

Designed for the FIRST Robotics Competition, the Jaguar module brings new motor control technology and safety features to the table that have been recognized by industry at large as an ideal solution from applications ranging from home appliances to pumps, ventilation and electric wheel-chairs.

Jaguar first leapt on to the scene as part of the FIRST Robotics Competition 2009 (FRC). FIRST (For Inspiration and Recognition of Science and Technology) is a not-for-profit organization founded by inventor Dean Kamen to fire young people's imaginations for technology and get their hands dirty at the same time. The competition was designed to give high school students first hand experience of professional tools used by scientists and engineers and give them real-world skills they can take forward into the workplace.



Earlier this year, Luminary Micro confirmed its position as the key supplier for the FRC, donating several thousand Stellaris Brushed DC Motor Speed Controllers (MDL-BDC) for the 2009 FRC Kit of Parts. On January 3, 2009, a Kit of Parts, made up of motors, batteries, a control system, and a mix of automation components - but no instructions, were distributed to more

than 1,680 teams of high-school students who had just six weeks to design, build, program and test their robots in preparation for regional events. Teams worked with mentors to build the robots.

The challenge measured the effectiveness of the robot build and displayed the power of team work. Based on Luminary Micro's powerful Stellaris 32-bit microcontrollers, the MDL-BDC "Jaguar" module is an intelli-

gent, variable speed control and power drive for 12V brushed DC motors.

Jaguar is allowed students to design increasingly complex robots, bringing new motor control technology to the FRC, including integrated limit switch inputs that function in combination with the brake/coast inputs. It also puts the spotlight on a number of new safety features including monitoring for instantaneous winding current, battery voltage

and ambient temperature all at the same frequency as the G-bridge is driven. In addition, power and motor terminals are color-code to reduce wiring errors in designs.

Luminary Micro is expecting Jaguar to spur innovation in network connected, distributed robotics systems, thanks to its Industry-standard Controller Area Network (CAN) interface for real-time networking control, three-pin quadrature interface for precise positioning and speed control plus analog input for an alternative method of servo operation.

The MDL-BDC module provides OEMs with a two-pronged approach. It is either offered as a volume production module for integration or a complete open-tool reference design enabling OEMs to kick start bespoke Stellaris-based designs.

The Stellaris MDL-BDC is powered by the Stellaris LM3S2616 microcontroller, featuring CAN and advanced motion control capabilities. The LM3S2616 microcontroller includes a robust combination of features, along with

the performance and efficiency associated with the ARM® Cortex™-M3 processor. The ARM Cortex-M3 controller core operates at 50 MHz, with 128 kB single-cycle flash, 16 kB single-cycle SRAM.

The MDL-BDC offers variable speed control for 12 V brush DC motors at up to 40 A continuous current. In addition, there is an industry-standard R-C servo type (PWM) interface, and a Controller Area Network (CAN) interface. The CAN communications interface provides real-time monitoring of current, voltage and speed, tuning of motor control parameters and an option to load module firmware. The module includes a status LED that indicates Run, Direction, and Fault conditions, control options and sensor interfaces, including a motor brake/coast selector, forward and reverse limit switch inputs, analog inputs, and quadrature encoder interfaces. The module is encased in industrial plastic and is cooled by a self-contained, temperature-controlled fan.



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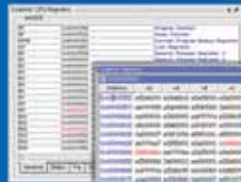
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