

New microstep motor integrates encoder, driver, and controller in a single convenient NEMA 11 package

Arcus Technology has developed the world's first all-in-one NEMA 11 microstep motor with driver, controller and encoder integrated into the motor's back cap, minimizing external electronics and wiring. Launched at the 2009 Lab Automation show, the new DMX-K-SA-11 stepper motor uses Renishaw's AM256 magnetic encoder chip for real-time position verification. The small package size of the magnetic encoder chip allows the motor to stay within the 1.1-inch-square form factor of the NEMA 11 standard. The new DMX-K-SA-11 stepper motor is ideal for size-sensitive biomedical, optical, semiconductor and similar applications requiring open-loop microstep motion with real-time position confirmation.



OnAxis™ magnetic encoder chip and all key motion components combine in a small package for size-sensitive applications

The integrated DMX-K-SA-11 is a 16-microstep driver that is capable of full, 1/2, 1/4, or 1/16 microsteps in three different stack sizes. Arcus Technology developed this unique design as an alternative to typical step motors that run open loop with sensors to detect position values after the move. The DMX-K-SA-11 is designed for customers and applications that require a position verification signal from the motor as well. By incorporating the Renishaw AM256 magnetic encoder chip into the back cap, Arcus was able to add this capability with no change in size or add-on external components or encoders. The electronics inside the back cap have a maximum ambient operating temperature of 85°C (185°F).

The stand-alone control uses Windows-based programming language similar to BASIC and is very easy to program. The DMX-K-SA-11 motor features RS-485 communication with a baud rate of 9600 to 115K bps. It has a trapezoidal acceleration profile control, 12 to 24 V DC voltage input and driver current from 100 mA to 1.5 A. It includes opto-isolated +Limit/-Limit/Home inputs and opto-isolated digital output. Its homing routine uses home input or limit input.



AM256 magnetic encoder chip combines ruggedness and performance

Renishaw's AM256 8-bit encoder chip is a solid state, compact magnetic solution for non contact angular position encoding over 360°, providing incremental, parallel, serial SSI and analogue sinusoidal output options. The encoder's integrated circuit senses the angular position of a diametrically polarized, cylindrical magnet placed above it. A circular array of Hall sensors around the center of the IC detects the magnetic flux density distribution at the surface of the silicon and delivers a voltage representation of the magnetic field distribution. Sine and cosine voltage outputs from the Hall sensors vary with magnet position, and are converted to absolute position with a fast 8-bit flash interpolator. Relative changes of angle position are output as incremental A quad B signals with 8-bit/256 counts per revolution.

With an operational range of -40 °C to +125 °C, high resistance to shock and vibration, and rotational speed capability up to 60,000 rpm, the AM256 combines ruggedness and performance needed for harsh environments. Working closely with its associate company RLS d.o.o, Renishaw offers an extensive line of solid-state magnetic encoder

chips based on the proven OnAxis™ Hall sensor technology, ranging from the AM256 8-bit to the AM8192B programmable 13-bit chip. Renishaw also custom designs solid state encoder solutions for motor OEMs.

OnAxis™ encoders are ideal for non-contact incremental or absolute position or velocity measurements for motion control applications in robotics, servo and step motors, semiconductor, medical, agriculture, as well as military applications.

Arcus Technology provides an extensive range of products with USB 2.0, Ethernet, and RS-485 communication. The company also handles programs and source codes for easy integration of motor/driver/controller solutions.

To learn more about Arcus Technology's motion control products visit: **www.arcus-technology.com**

For more information on OnAxis™ rotary encoders and Renishaw's full line of magnetic sensors/encoders visit: **www.renishaw.com/encoders**