

BSM Servomotors with BiSS Absolute Feedback

Development started in 2000 to establish an open feedback protocol that surpassed existing technology implemented in the “classic” absolute interfaces. This resulted in the first BiSS encoders being produced in 2002, and since then, they have fulfilled their charter to become a successful fully digital open source absolute encoder protocol.

Features and advantages of BiSS devices were established from the following original charter criteria:

All Digital Noise Immunity – Because BiSS is an all-digital interface it eliminates reliance on 1V peak-to-peak analog signals. Thus a noise immune link is created between the drive and motor that provides more robust equipment. As servos are used in more demanding applications, noise immunity continues to become even more important. The “classic” interface requires taking into account special considerations regarding cable type, cable length, and overall system speed. BiSS removes those headaches.

Internal Interpolation - BiSS encoders utilize interpolation which occur inside the encoder ASIC, and since the raw data signals travel micrometers within the ASIC they are not affected by capacitive attenuation. Normally absolute based systems have a common disclaimer “performance reduction in terms of speed and torque ripple four times the line rate will result”. A BiSS system does not contend with this paradigm. BSM servomotors with BiSS feedback enables designers to optimize and push limits of system response and position accuracy.

Synchronous Serial - The technology of BiSS is built upon a sound foundation of proven RS422/RS485 technology. Clocking at 10MHz produces unparalleled position updates in less than 10 microsecond intervals. This fast update rate provides ultra smooth motion at slow speeds. Machines provide smoother cut profiles and improved performance.

Auto Cable Length Compensation - Cable lengths affect position accuracy and feedback throughput in a “classic” system. BiSS encoders automatically calculate a compensation factor for cable length in the first position read. This ensures that the position read is properly synchronized. This synchronicity allows for robust motion control.

Position Reset - The encoder’s zero position can be rewritten (via bidirectional communication) to a known value or zeroed at a given shaft position. Zero position provides the ability to home systems easier and create electronic setups. Control schemes enabled with this function reduce setup time and improve repeatability.

Long Life - The encoder has been engineered to provide protection to the entire key moving components for 25 years of continuous duty under maximum operating conditions. In life testing, encoders passed tests that exceeded 3.75×10^{10} revolutions.