

Incremental optical linear encoder and angle encoder now offers 1 nm resolution and ultra-low positional noise

Renishaw, a world leader in measurement and encoder technology, is introducing new 1 nm and 2 nm resolution versions of its successful TONiC™ incremental encoder range.

Available in linear encoder and rotary encoder formats, the new higher resolution options comprise a standard TONiC readhead and new Ti20KD (1 nm) or Ti10KD (2 nm) interfaces that apply high interpolation rates to achieve very fine resolution. Furthermore, TONiC's low-noise optical scheme with superior photometry has been combined with advanced filtering inside the Ti20KD / Ti10KD interfaces to reduce the jitter (noise on reported position) to an impressively low level of just 0.51 nm RMS.

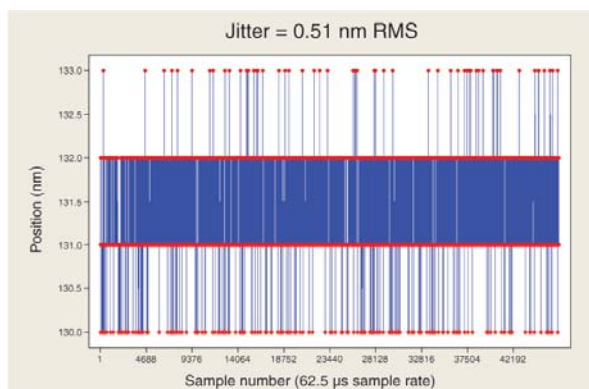


Figure 1: TONiC with Ti20KD interface showing 0.51 nm RMS noise (jitter)

The reduced jitter and increased resolution result in an encoder that provides significantly enhanced positional stability and low-speed velocity control. This improvement is additional to the benefits of the dynamic signal conditioning included as standard on all TONiC readheads. As a result, 1 nm and 2 nm TONiC incremental encoders offer all the benefits of a 20 micron pitch encoder, such as easy set-up, greater ruggedness and superior dirt immunity, yet they also rival the resolution and noise levels of much finer pitch encoders.

The linear encoder version of TONiC is available with a comprehensive range of scale options. RGSZ is the latest evolution of Renishaw's ubiquitous gold tape scale, now with integral

IN-TRAC™ optical reference marks. RELM Invar® spars offer “zero” thermal expansion and $\pm 1 \mu\text{m}$ accuracy on lengths up to 1130 mm, whilst for high performance on long axes and significantly more robustness than glass scales, RSLM stainless steel spars have a total accuracy of $\pm 4 \mu\text{m}$ over 5 m, with lengths up to 10 m available. Additionally, for very fast and easy installation, the new *FASTRACK*™ linear encoder scale system comes with low-profile RTALC tape scale, offering $\pm 5 \mu\text{m/m}$ accuracy.



Rotary (angle) encoders options are also well served, with RESM rings in a range of standard diameters from 52 mm to 550 mm, with even larger sizes available. For even higher performance, ultra-high accuracy REXM ring encoders have a total installed accuracy better than ± 1 arc second on ring diameters greater than 100 mm, when used with dual readheads.

The interfaces have been named after their interpolation factors: Ti20KD refers to 20k digital interpolation (post-quadrature), which equates to 1 nm resolution.

As with all Renishaw encoders, TONiC incremental encoders are backed by a truly responsive global sales and support network. Furthermore the product satisfies the highest environmental standards, with both WEEE and RoHS compliance.

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