

Nanometer Measurement with Interpolation Electronics

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Abstract

This paper integrated multi-domain know-ledge of electronics, optics, control as well as precision measurement, and proposing a high resolution subdividing electronics module to the sinusoidal encoder output of a positioning motor, such that the module can not only be used as a counter for linear and/or angular measurements, but also subdivide the periods of the sinusoidal encoder signals up to 1600 times. From the results of experiment test it can be seen that the whole module is suitable for those applications requiring high-resolution encoder, nanometer measurement as well as fast data acquisition with phase tolerance of ± 45 degrees.

Keyword : LVDT, interpolation circuit, quadrature decoder, quadrature-phase interferometer.