

# A DSP-Based Resolver-to-Digital Conversion Using Pulse Excitation

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## Abstract

Resolvers are absolute angle measurement and are mounted on the motor shaft to get the motor's absolute angular position. This study proposes a digital signal processor (DSP) based resolver-to-digital (R/D) conversion using pulse excitation. A pulse signal generated by a DSP is utilized as a reference signal coupled into the resolver's rotor winding and provides primary excitation. The output signals of the resolver are two orthogonal stator coils modulated with the sine and cosine of the motor shaft angle. The sine and cosine modulated output signals are sampled by the analog-to-digital (A/D) converter of the DSP. The sampled frequency of output signals are the same frequency as the pulse signal. The angular position is derived by the inverse tangent of the quotient of the demodulated sine and cosine samples. Test results are presented to validate the performances of the proposed scheme.

Keyword : resolver-to-digital (R/D); angle measurement; DSP; pulse excitation