

A Simple and Efficient Method for Accurate Measurement and Control of Power Frequency Deviation

Authors : S. J. Arif

Abstract : In the presented technique, a simple method is given for accurate measurement and control of power frequency deviation. The sinusoidal signal for which the frequency deviation measurement is required is transformed to a low voltage level and passed through a zero crossing detector to convert it into a pulse train. Another stable square wave signal of 10 KHz is obtained using a crystal oscillator and decade dividing assemblies (DDA). These signals are combined digitally and then passed through decade counters to give a unique combination of pulses or levels, which are further encoded to make them equally suitable for both control applications and display units. The developed circuit using discrete components has a resolution of 0.5 Hz and completes measurement within 20 ms. The realized circuit is simulated and synthesized using Verilog HDL and subsequently implemented on FPGA. The results of measurement on FPGA are observed on a very high resolution logic analyzer. These results accurately match the simulation results as well as the results of same circuit implemented with discrete components. The proposed system is suitable for accurate measurement and control of power frequency deviation.

Keywords : digital encoder for frequency measurement, frequency deviation measurement, measurement and control systems, power systems

Conference Title : ICCT 2016 : International Conference on Communication Technology

Conference Location : London, United Kingdom

Conference Dates : June 23-24, 2016