ADC INTERFACE WITH INSTRUMENTATION AMPLIFIER

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Abstract— Design for an instrumentation amplifier with ADC and Decoder. main purpose of an instrumentation amplifier is to amplify small signals that may be riding on large common-mode voltages .The Detailed circuit analysis shows the amplification of input sinusoidal wave and the conversion of the analog signal to digital using an analog to digital convertor (ADC) resulting in a mixed signal circuit and decoder is used as an display for the out digital square wave. We can see the digital output which can be interfaced for 7 segment LED

Keywords: Instrumentation amplifier, ADC, Decoder

1. Reference Circuit Details

Instrumentation amplifier is an type of differential amplifier that has been outfitted with input buffer amplifiers, which eliminate the need for input impedance matching so which makes the amplifier suitable for measuring parameters. The main purpose of an instrumentation amplifier is to amplify small signals that may be riding on large common-mode voltages, Amplifies the difference between the voltages existing at its two input terminals. .The ideal common-mode gain of an instrumentation amplifier is zero and it also amplifies the input sinusoidal wave. In this circuit we have also added ADC to convert the amplified output voltage to a digital square wave and decoder is also used to display the squared wave as '0' and '1'. We can see the digital output which can be interfaced for 7 segment LED

Some main advantages of this circuit is low noise, very high open loop gain, High input impedance, Low Output Impedance

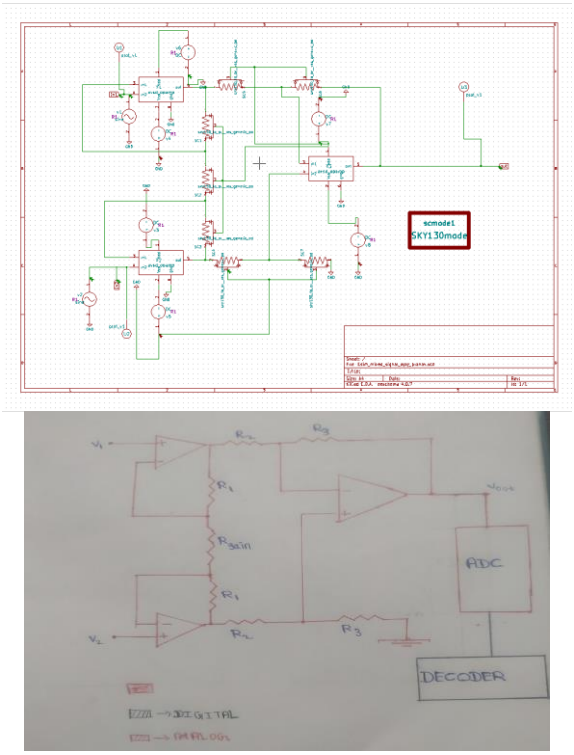

Fig1 : ADC INTERFACE WITH INSTRUMENTATION AMPLIFIER

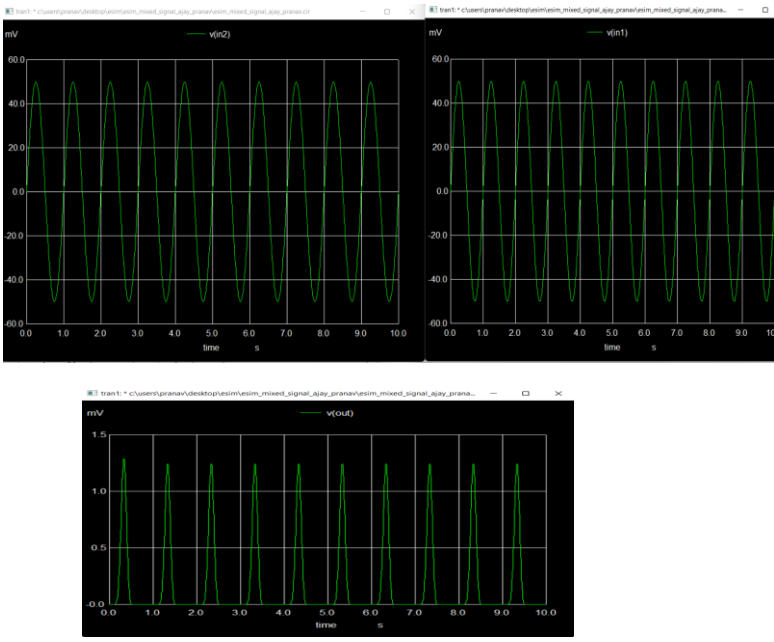

Fig2 : Input and Output circuit waveform

References : 1. https://youtu.be/NvyDw8ZpLd0