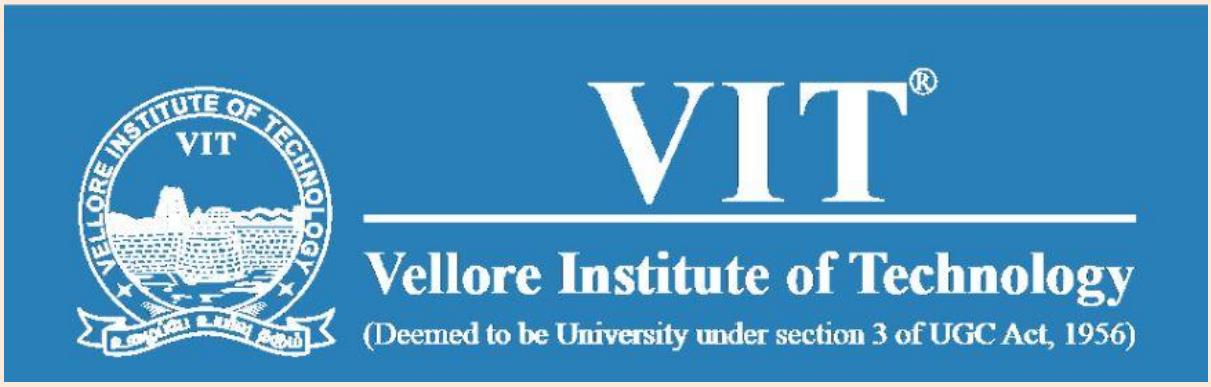

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Lab Assesment - 4

Signal Conditioning

Aim:

To condition the given input signal by:

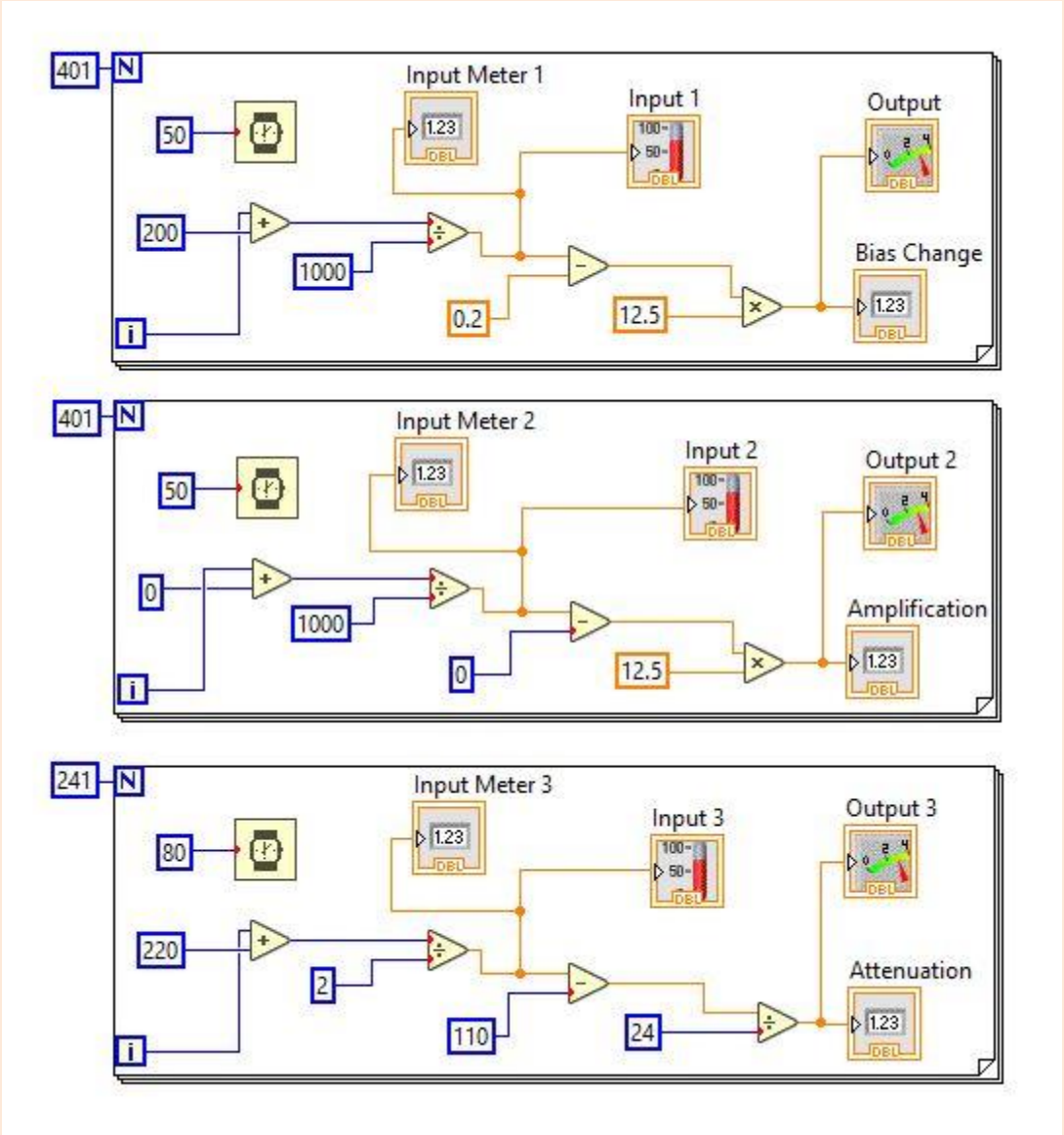
1. ***Level Change**: The input is given in **0.2 - 0.6 V** and the output should be in **0 - 5 V***
2. ***Amplification**: The input is given in **0 - 0.4 V** and the output should be in **0 - 5 V***
3. ***Attenuation**: The input is given in **110 - 230 V** and the output should be in **0 - 5 V***

***Abstract**:*

This problem can be countered using two methods. By using a discrete value input as well as by using a signal input. Signal conditioning is a necessary part of communication Engineering. The signals received after transmission should be conditioned first before using it for any other application; as the mechanism using the signal input may not recognize an unconditioned signal usually since it will not have a wide range of signal amplitudes or frequencies which the machine can work in.

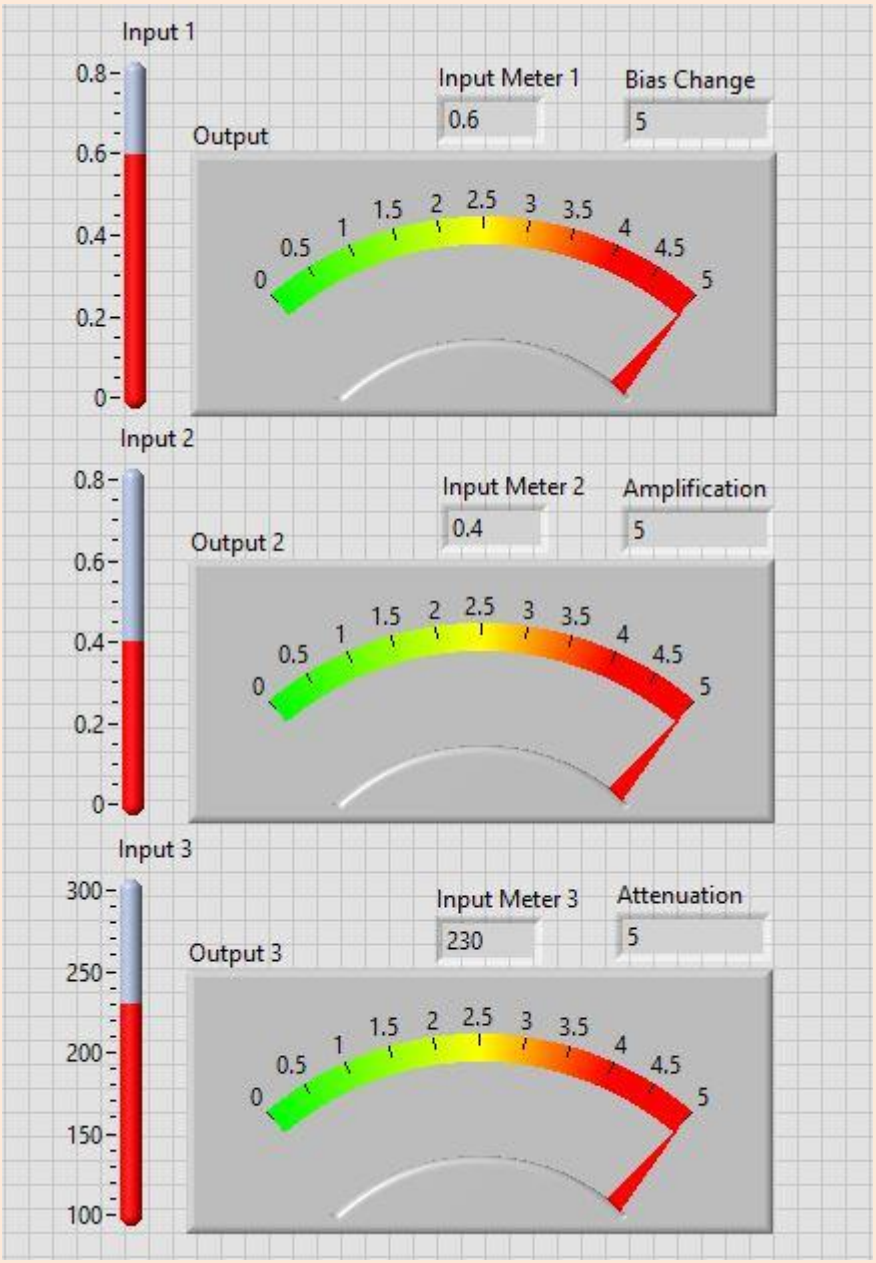
Both the methods, in this program is completely automated using a 'for' loop which covers the entire range of input with the precision of two decimal points. And each of these inputs is converted according to the question, whether to amplify, attenuate or level change. All 3 are displayed in the diagrams below.

***Discrete Value Input**:*

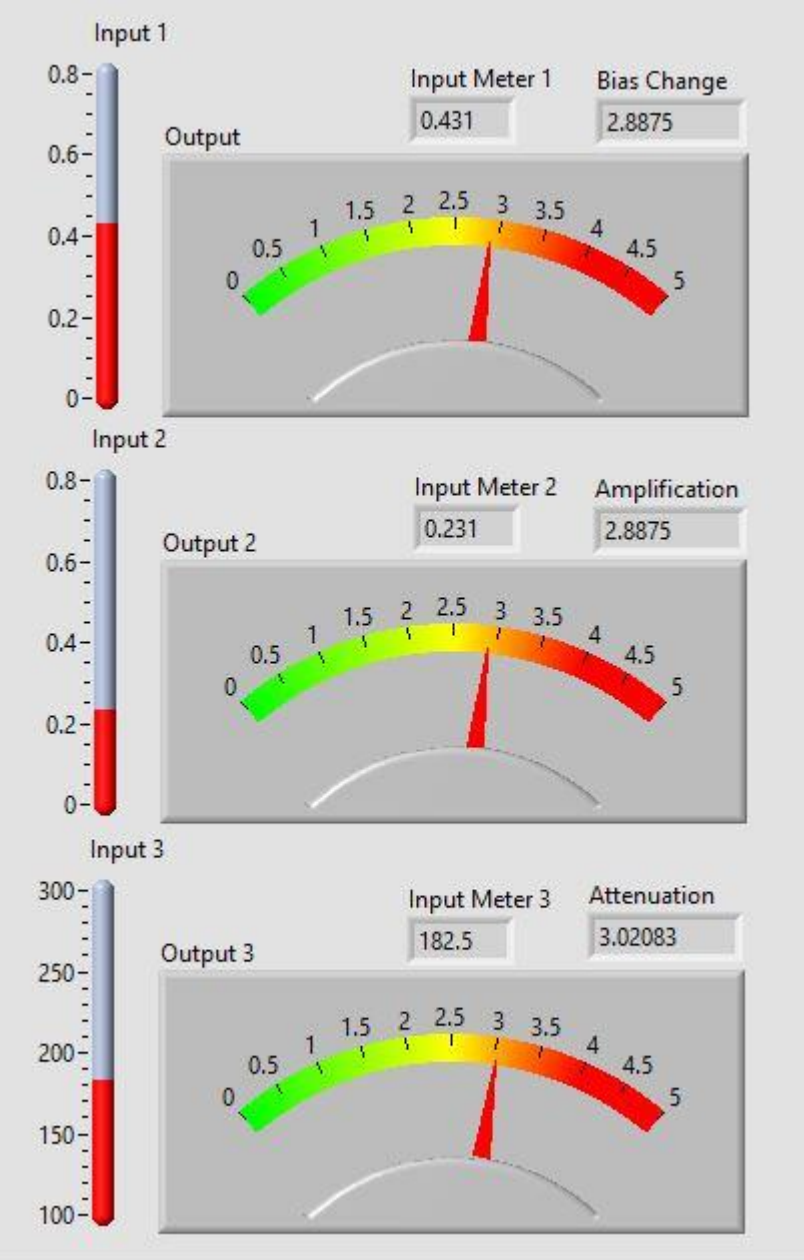


These for loops generates numbers with a precision of 2 decimal points and as the input changes, the value of the output changes corresponding to the question given with the algorithm set by the programmer.

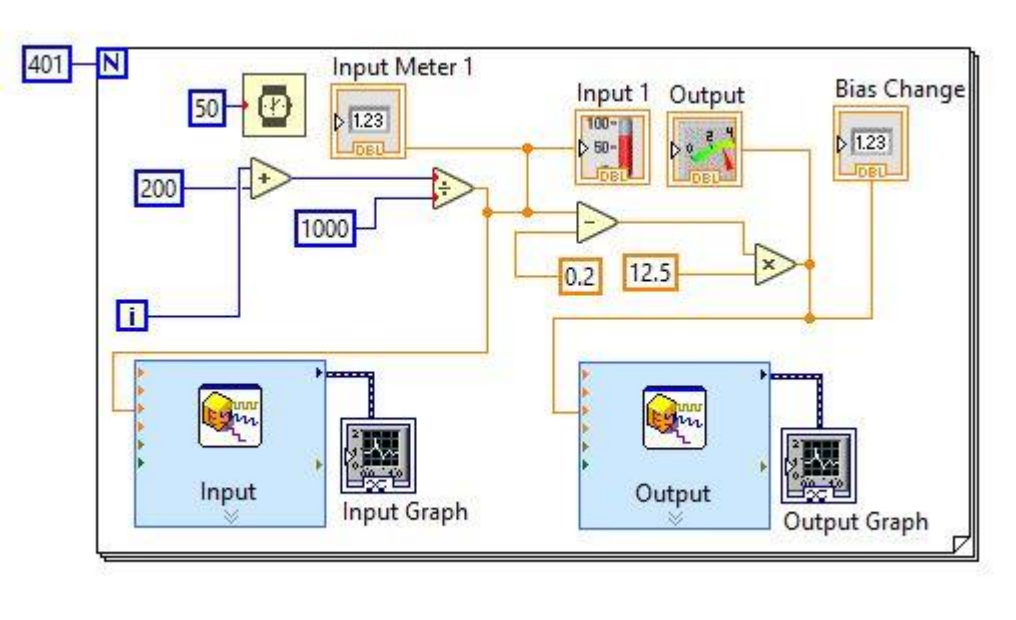
Output Diagram 1:



Output Diagram 2:



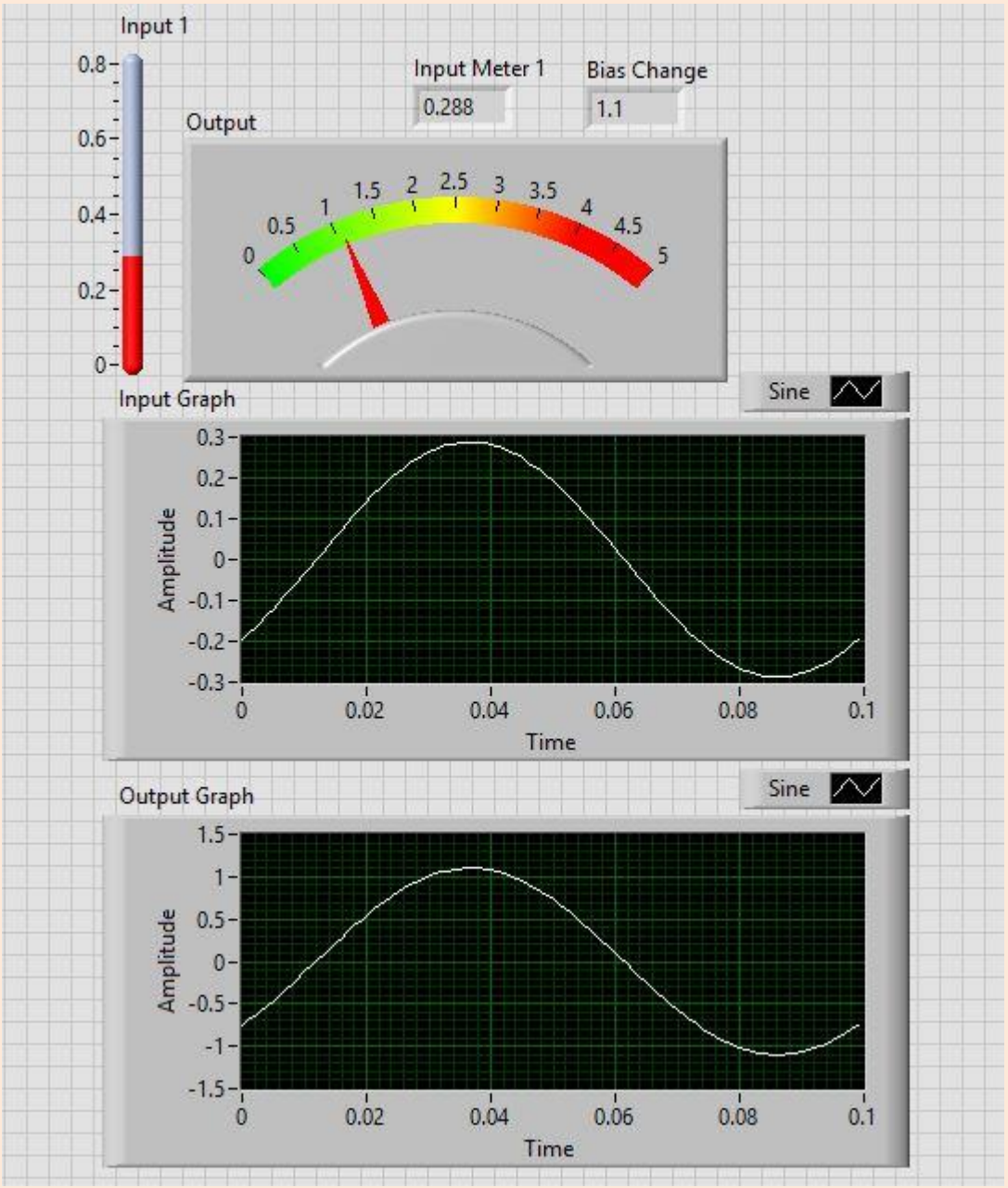
***Signal Input 1 – Level Change**:*



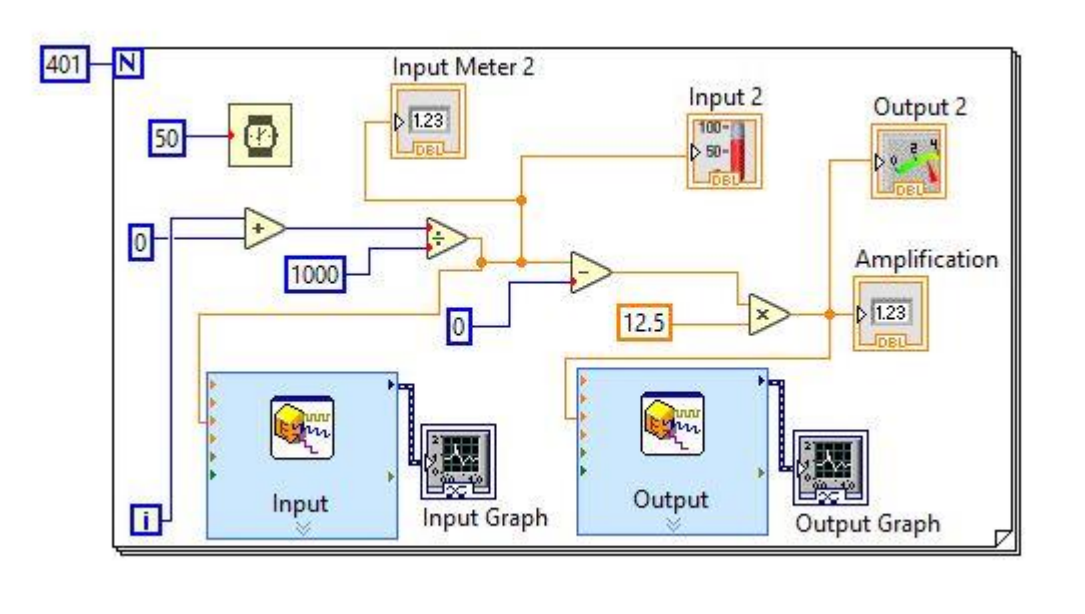
Similarly, the same algorithm can be applied to a graphical interface, where the amplitude of the graph (in the current scenario), can be modified and conditioned according to the programmers needs. The same can be applied in shifting frequencies and phases as well.

This shows the input diagram of a level shifter where the input and output is not only represented by an analog meter but also by a graph which shows a sine wave with a constant frequency and phase but with a varying amplitude according to the input given by the for loop.

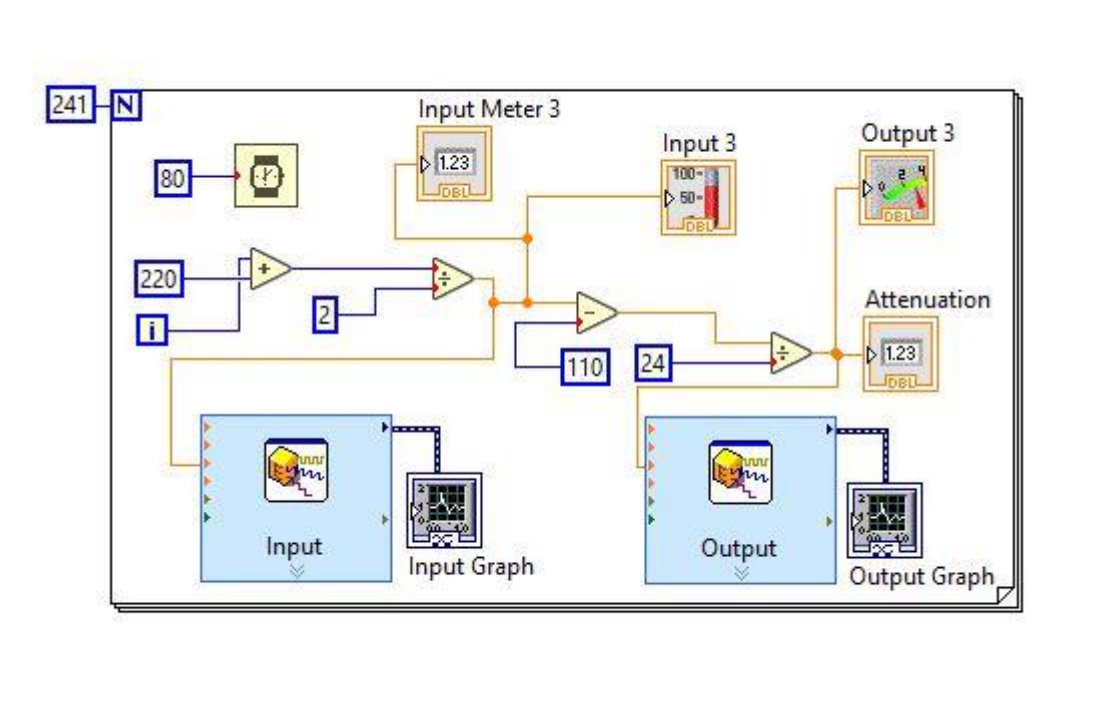
Signal Output 1 – Level Changing:



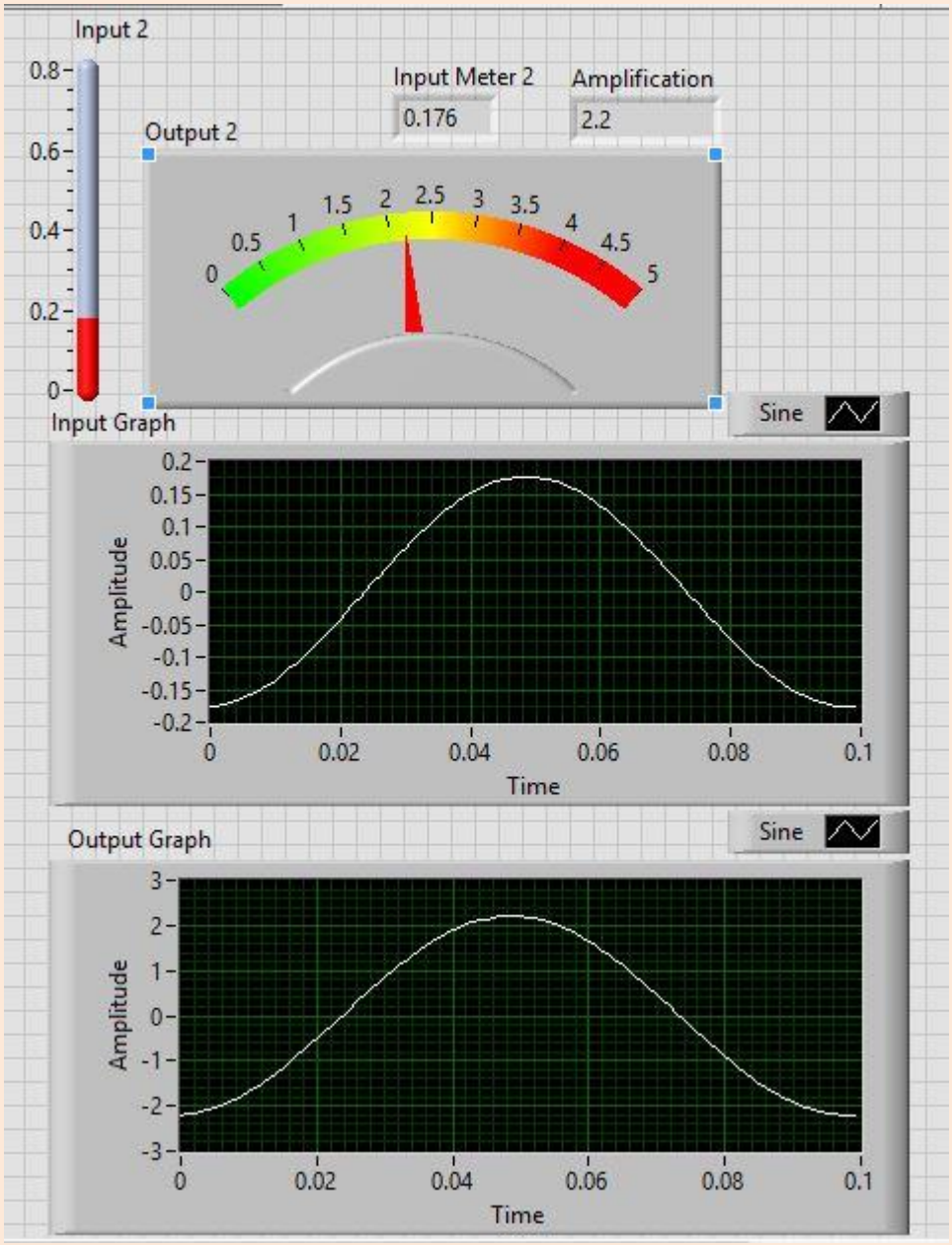
Signal Input 2 – Amplification:



Signal Input 3 – Attenuation:



Signal Output 2 - Amplification:



Signal Output 3 - Attenuation: