H006
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Signal Processing Lab

Subject- Virtual Instrumentation

EXPERIMENT NO. 4

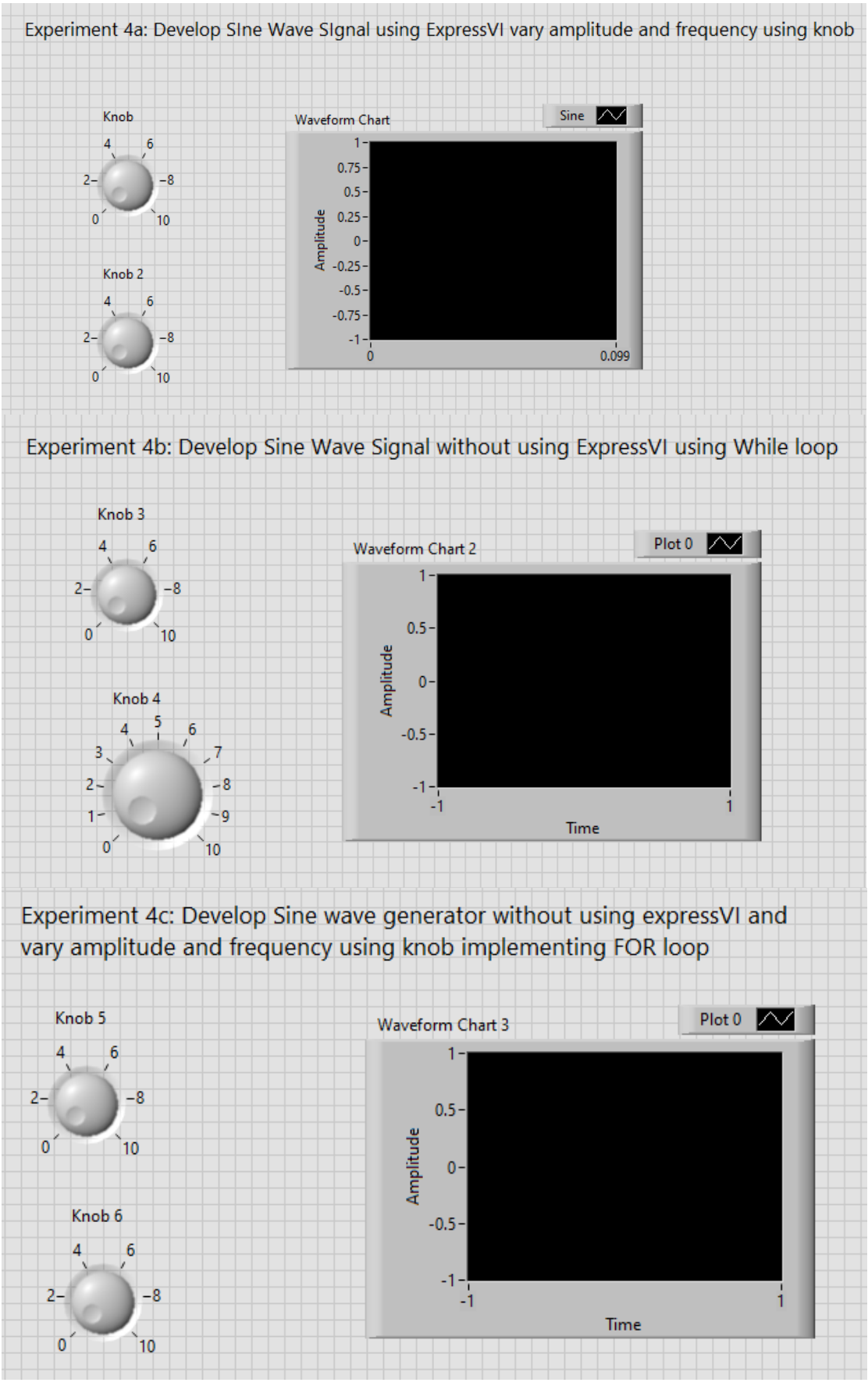
Aim:
4A – Develop SIne Wave SIgnal using ExpressVI vary amplitude and frequency using knob
4B – Develop Sine Wave Signal without using ExpressVI using While loop
4C – Develop Sine wave generator without using expressVI and vary amplitude and frequency using knob implementing FOR loop
Software Used : PC with software (NI LabVIEW)

Theory:
Express VIs are pre-built, configurable Virtual Instruments (VIs) in LabVIEW that allow users to quickly and easily implement common functionality in their programs without the need for custom coding. They are essentially graphical representations of complex programming concepts, where the user can manipulate inputs and outputs through a simple, user-friendly interface. Express VIs can be found in the Functions palette in LabVIEW and are grouped into categories based on their functionality.
Some Express Vis present in LabVIEW include:

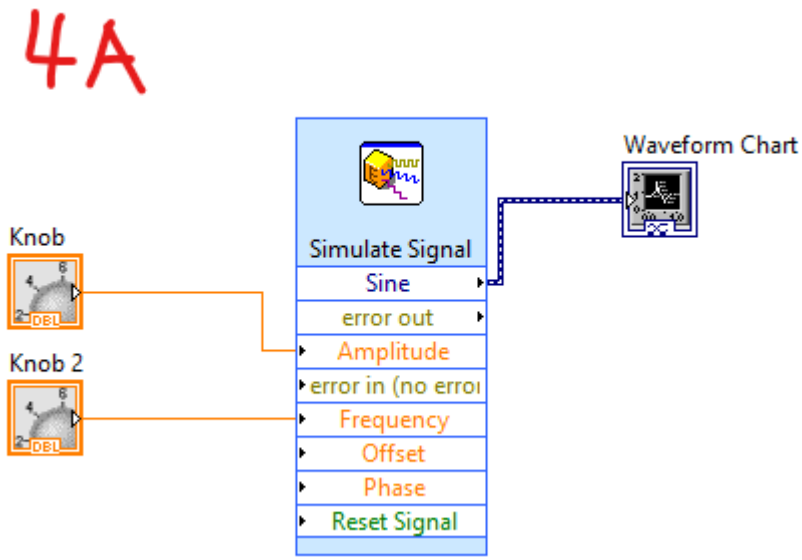
- Signal Processing: These VIs provide various functions for analyzing and processing signals. For instance, the Filter Express VI can be used to filter out noise from a signal by applying a low-pass, high-pass, or band-pass filter.
- File I/O: These VIs allow users to read from and write to files on disk. For instance, the Read From Spreadsheet File Express VI can be used to read data from a spreadsheet file and convert it to a LabVIEW array.
- User Interface: These VIs provide various functions for building user interfaces, such as creating buttons, sliders, and graphs. For instance, the XY Graph Express VI can be used to create a graph that displays X-Y data in real-time.
- Math and Analysis: These VIs provide various mathematical functions and tools for analyzing data. For instance, the Peak Detector Express VI can be used to identify peaks in a signal.

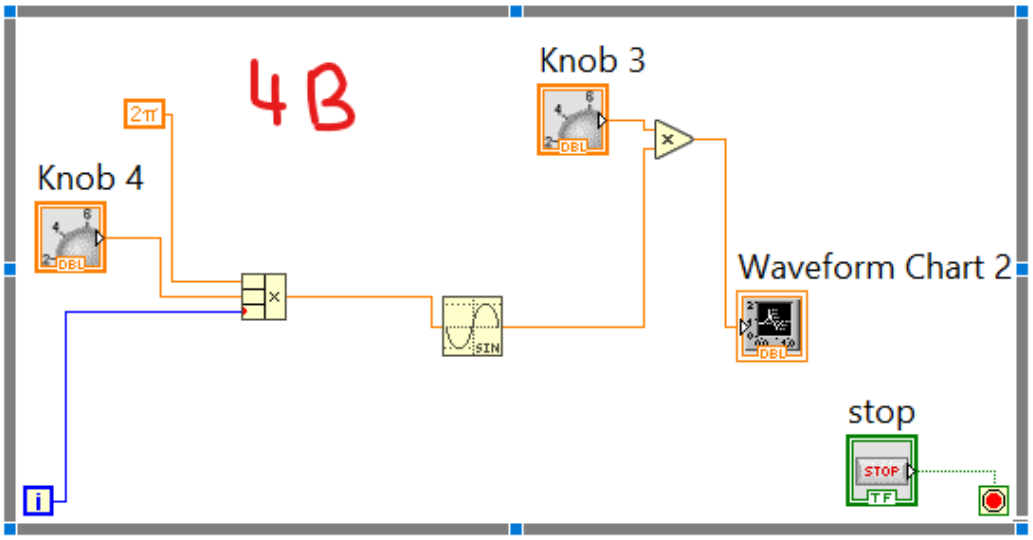
Express VIs are designed to be easy to use, with simple interfaces that require minimal configuration. They are a great way to speed up the development process and reduce the amount of custom coding required for common tasks. Additionally, Express VIs are fully customizable, allowing users to modify the underlying code to meet their specific needs.

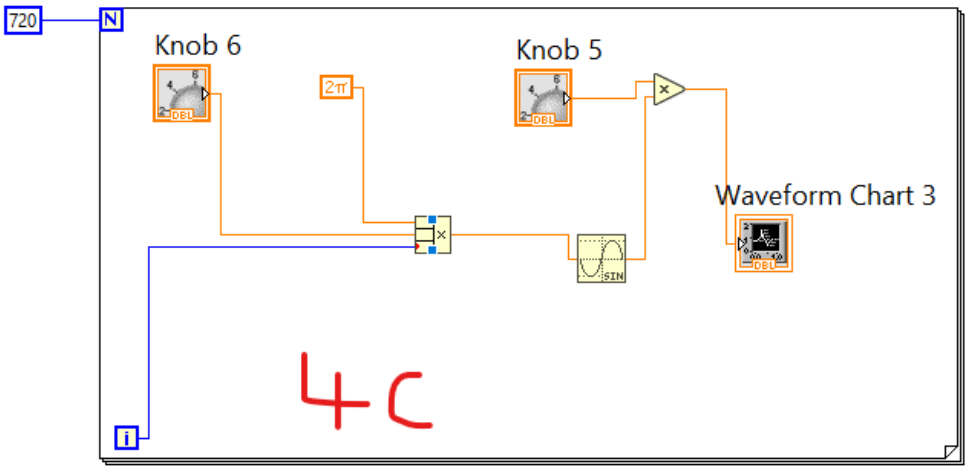
Front Panel:


Experiment 4a: Develop SIne Wave SIgnal using ExpressVI vary amplitude and frequency using knob
Knob
Knob 2
Waveform Chart
Sine
Amplitude
0
0.099
Experiment 4b: Develop Sine Wave Signal without using ExpressVI using While loop
Knob 3
Knob 4
Waveform Chart 2
Plot 0
Amplitude
Time
Experiment 4c: Develop Sine wave generator without using expressVI and vary amplitude and frequency using knob implementing FOR loop
Knob 5
Knob 6
Waveform Chart 3
Plot 0
Amplitude
Time

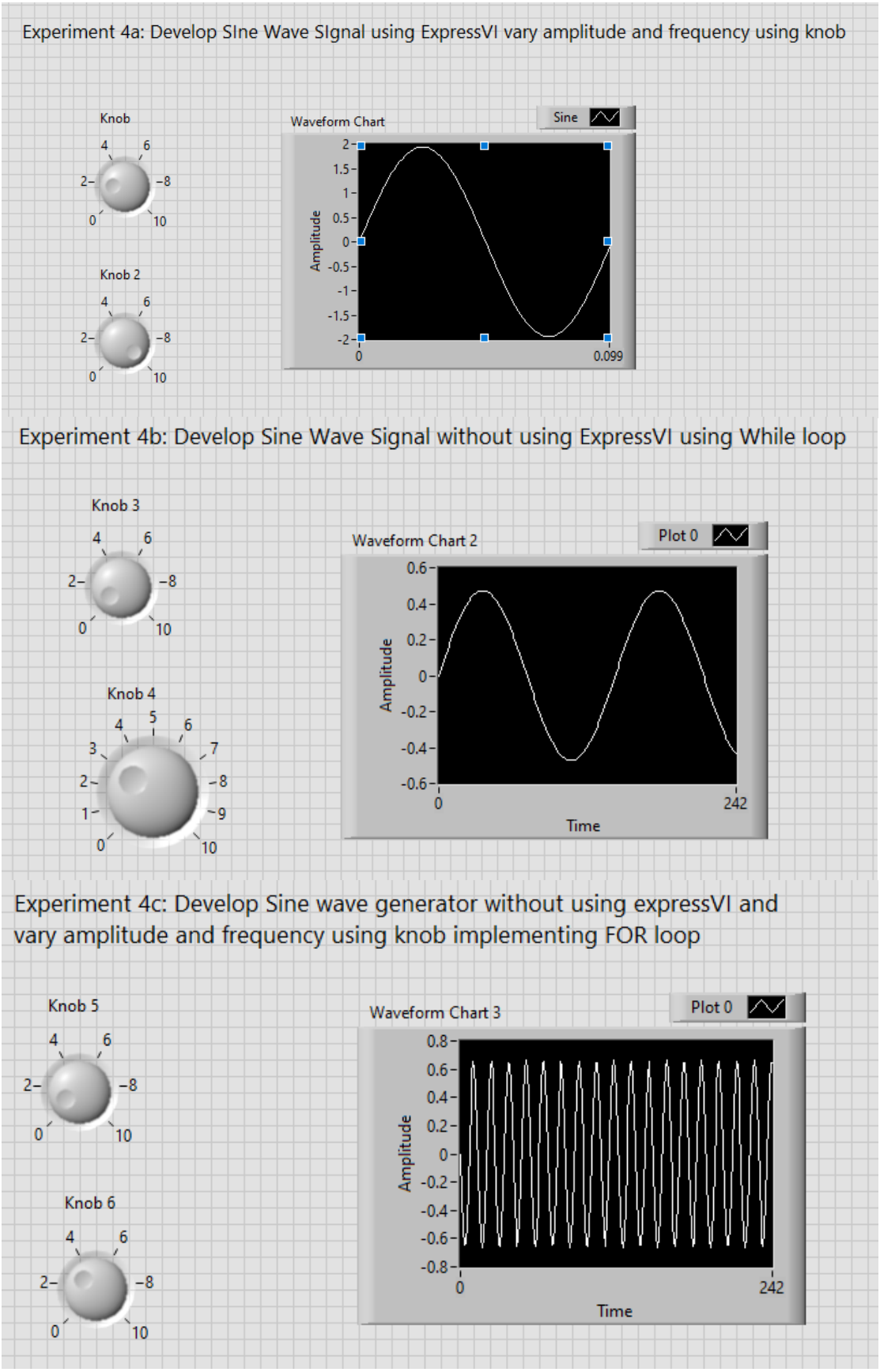
Block Diagram:







Output :


Experiment 4a: Develop SIne Wave SIgnal using ExpressVI vary amplitude and frequency using knob
Knob
Knob 2
Waveform Chart
Sine
Amplitude
0.099
Experiment 4b: Develop Sine Wave Signal without using ExpressVI using While loop
Knob 3
Knob 4
Waveform Chart 2
Plot 0
Amplitude
Time
242
Experiment 4c: Develop Sine wave generator without using expressVI and vary amplitude and frequency using knob implementing FOR loop
Knob 5
Knob 6
Waveform Chart 3
Plot 0
Amplitude
Time
242

Conclusion :

The experiment was carried out successfully in LabVIEW.