

Conclusions

Summary

This report starts with a general introduction to analog to digital conversion methods. After that it gives more details about a specific analog to digital conversion method which is the successive approximation analog to digital conversion with its implementation and testing.

The project mainly aimed to design and simulate an 8-bit successive approximation analog to digital converter using design manager software.

The resolution of the analog to digital converter could be increased by increasing the number of bits in it. The higher the resolution the smaller the step size and the more accurate the digital output is.

Critical appraisal

Although the project managed to achieve all of the requirements, there were several problems faced in implementing and testing the circuit. One of the main problems was designing the control logic in a way that the register is controlled by it. It has been solved by designing the control logic as an encoder with AND and OR gates. Another issue was making the switches of the digital to analog converter (DAC) automatically switch on and off in order to make the circuit works and test it. This problem was solved using NMOS switches that open when the received signal is 0 (low) and close when the received signal is 1 (high)

Future work

This project can be expanded to be used for a larger number of bits which will provide us with a finer resolution, but the speed of the analog to digital converter should be taken in to consideration when analyzing and testing the analog to digital converter.

After calculating the speed of the analog to digital converter, the sample and hold process could be added to prevent overloading of the bits. The sample and hold process provides the analog to digital converter with a memory that holds the analog voltage (sample) until the analog to digital conversion ends. Then this sample is released and another sample (analog voltage) is held. This procedure is repeated with the same sequence till the whole conversion is finished.