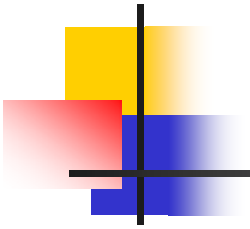
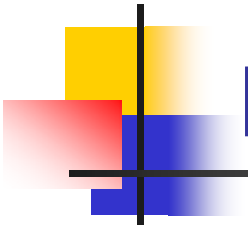
Virtual Laboratory for Electrical Circuit Course

Hasanul A. Basher
Saliman A. Isa
M'Hamed A. Henini



Overview

- Project Description
- Hardware and Software used
- Laboratory Exercises
- Conclusions

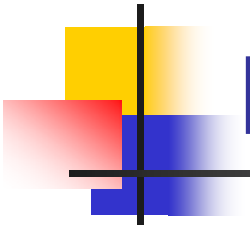


Project Description

- Virtual lab is developed
- Labs based on data acquisition techniques
- Utilizes DAQ card, DAQ accessory board, and breadboard
- Functions are implemented using LabVIEW vis.
- Will replace traditional labs in circuit
- Internet Developers Toolkit offers flexibility to offer lab via Internet

Hardware and Software used

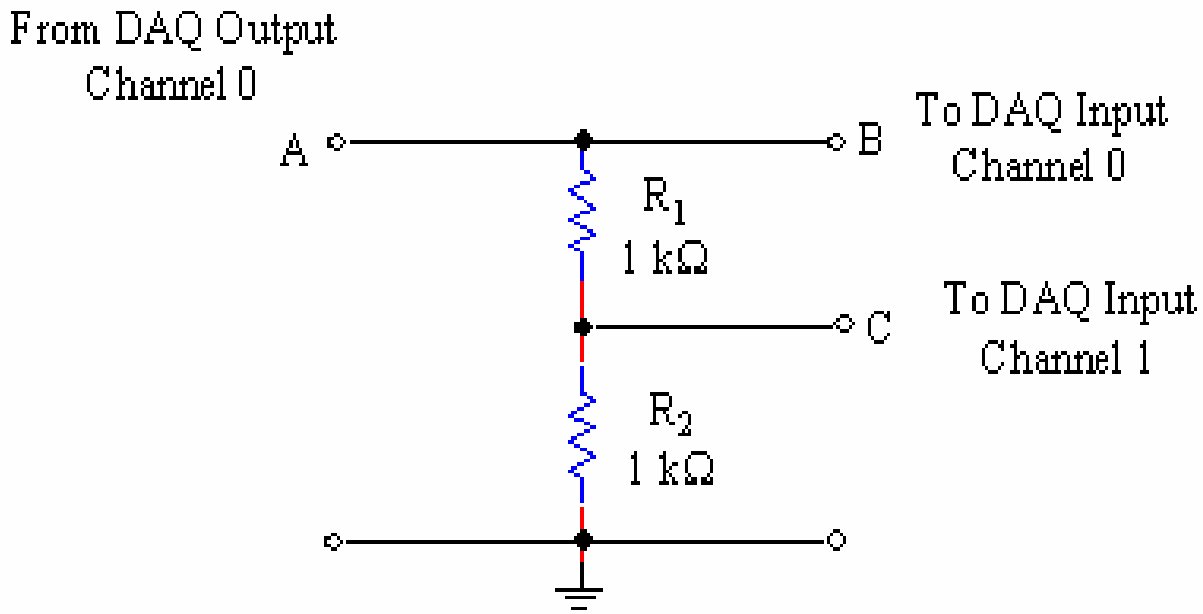
- LabVIEW 6i (Software)
- PCI-6024E (DAQ Board)
- SCB-68 (DAQ Accessory Board)
- Breadboard & Circuit Elements



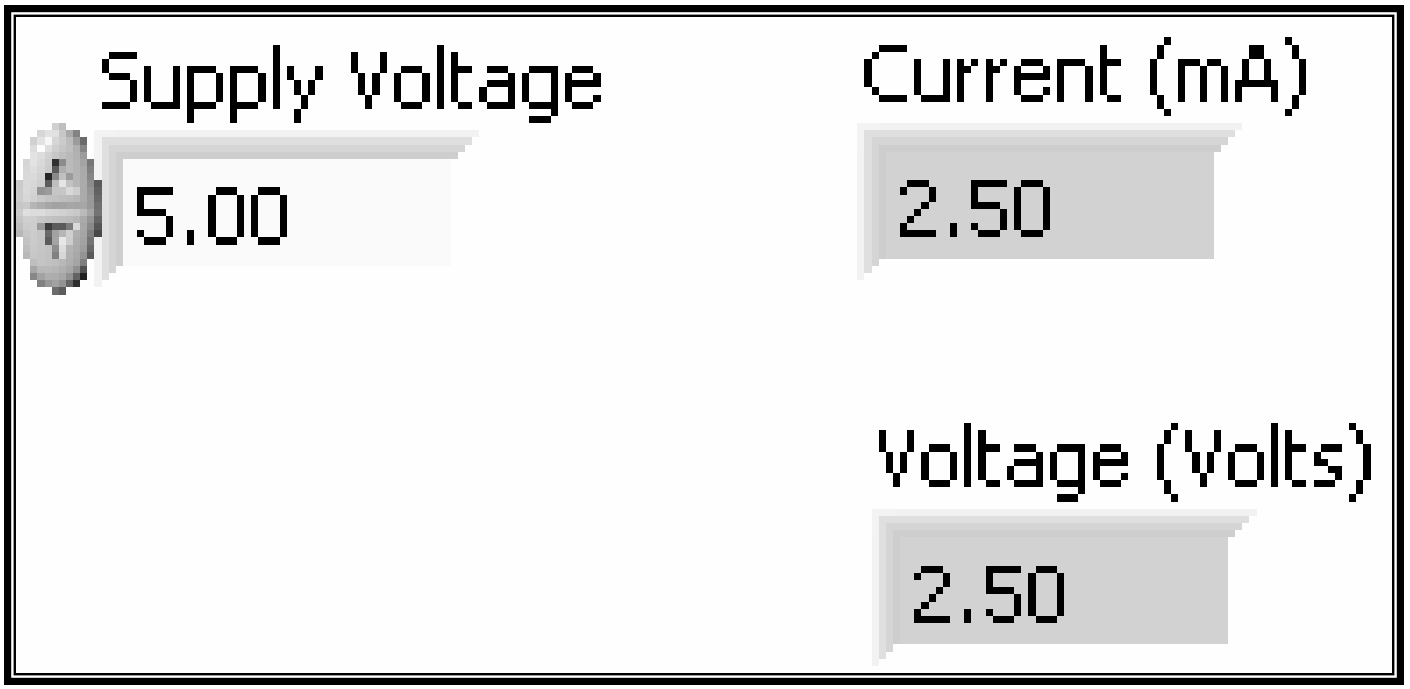
Laboratory Exercises

- Voltage Across a Resistor
- VI Characteristics of Resistance
- Capacitor Charging in RC Circuit
- Capacitor Charging at Time Constant
- Function Generator
- Oscilloscope

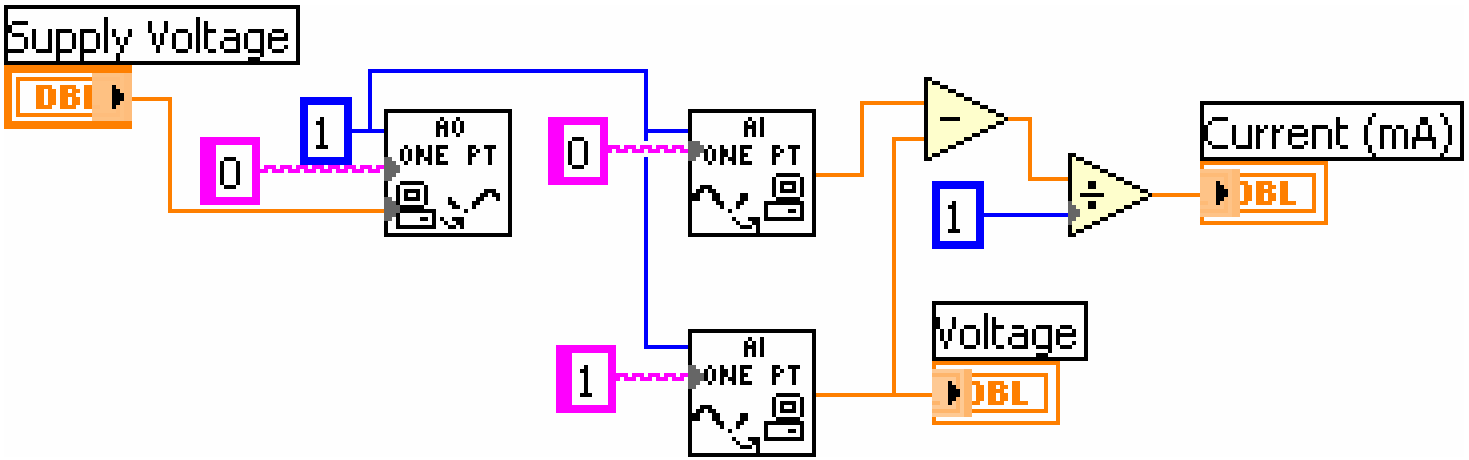
Circuit for Voltage Across Resistor



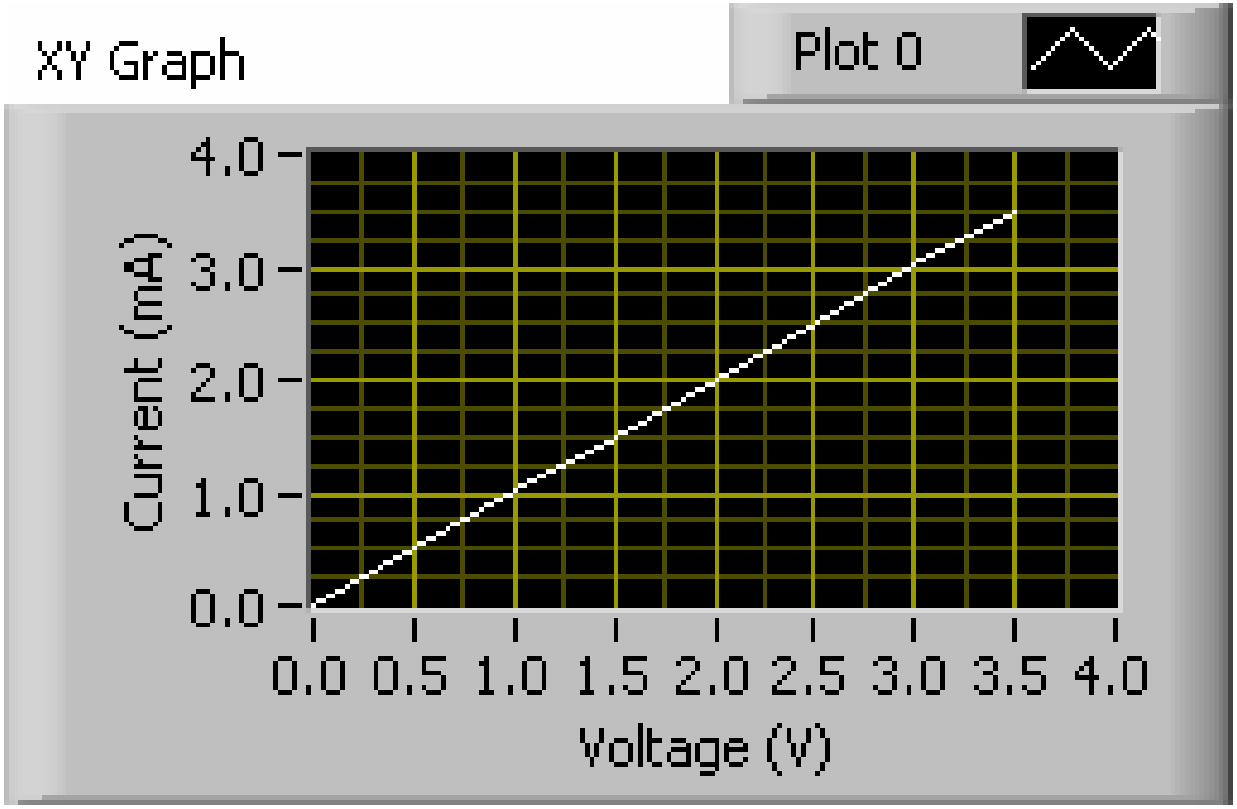
LabVIEW Front Panel



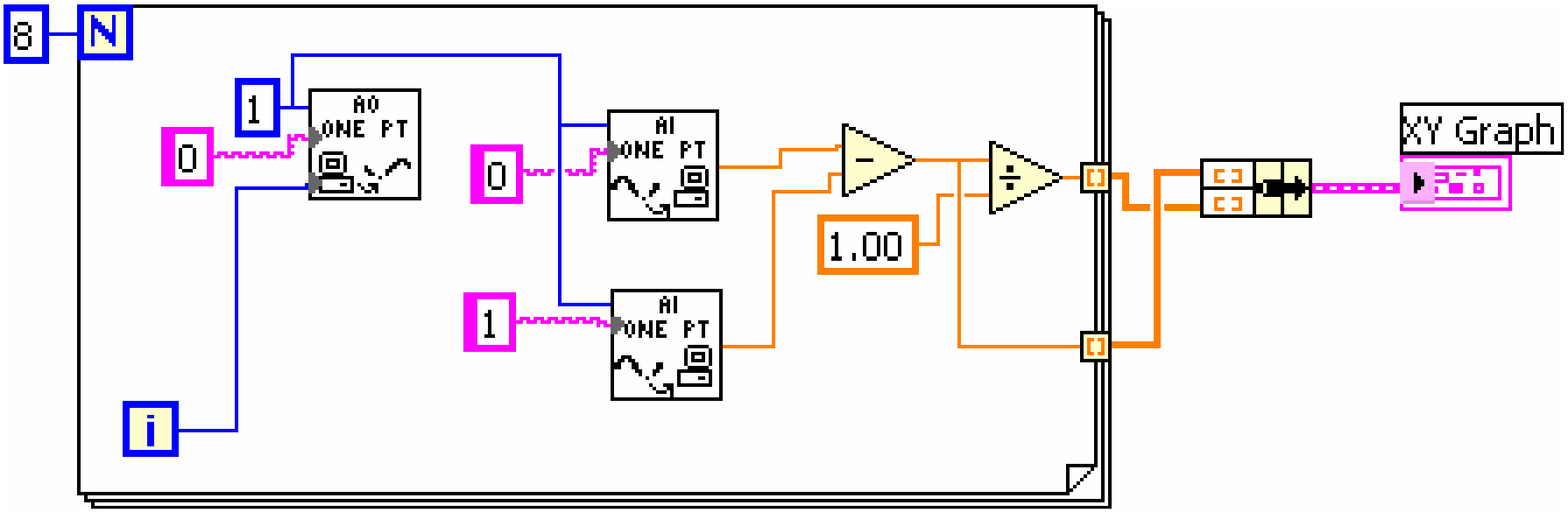
LabVIEW Block Diagram



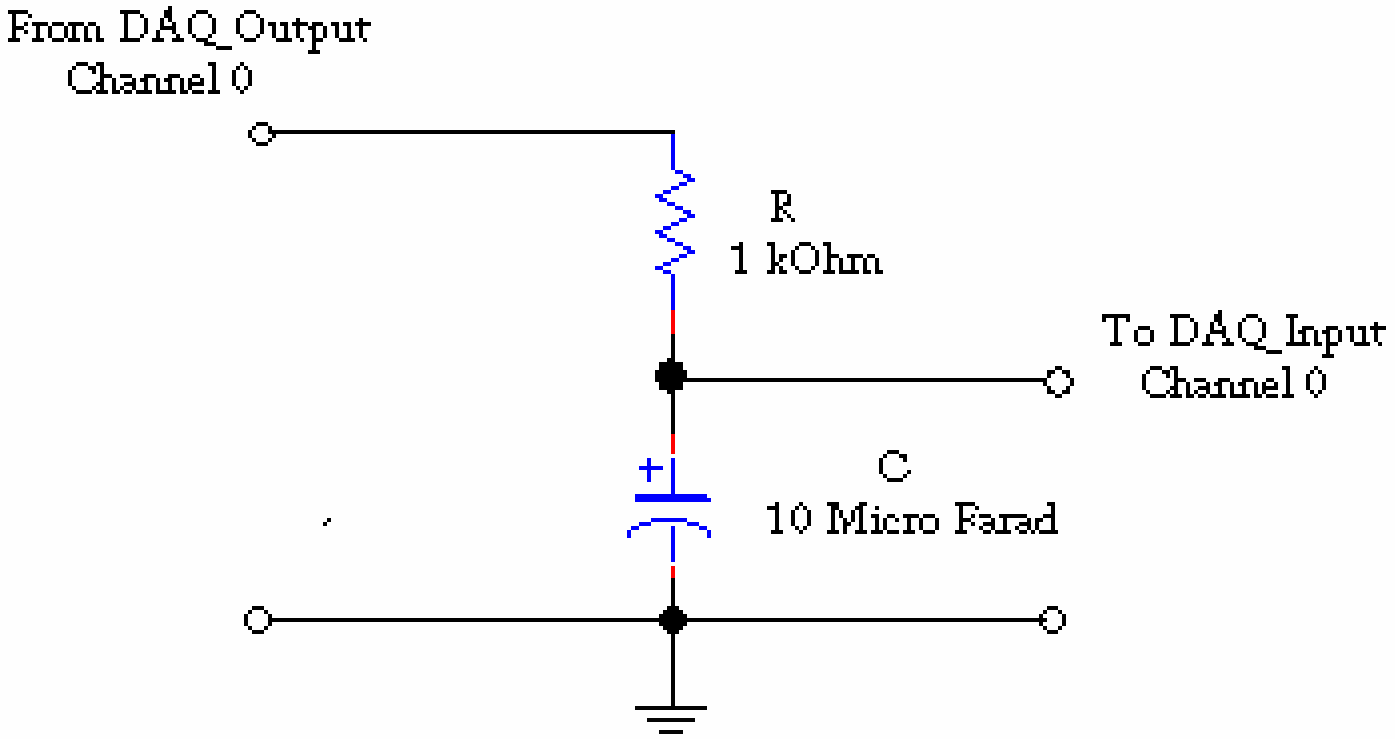
Front Panel for VI Characteristics



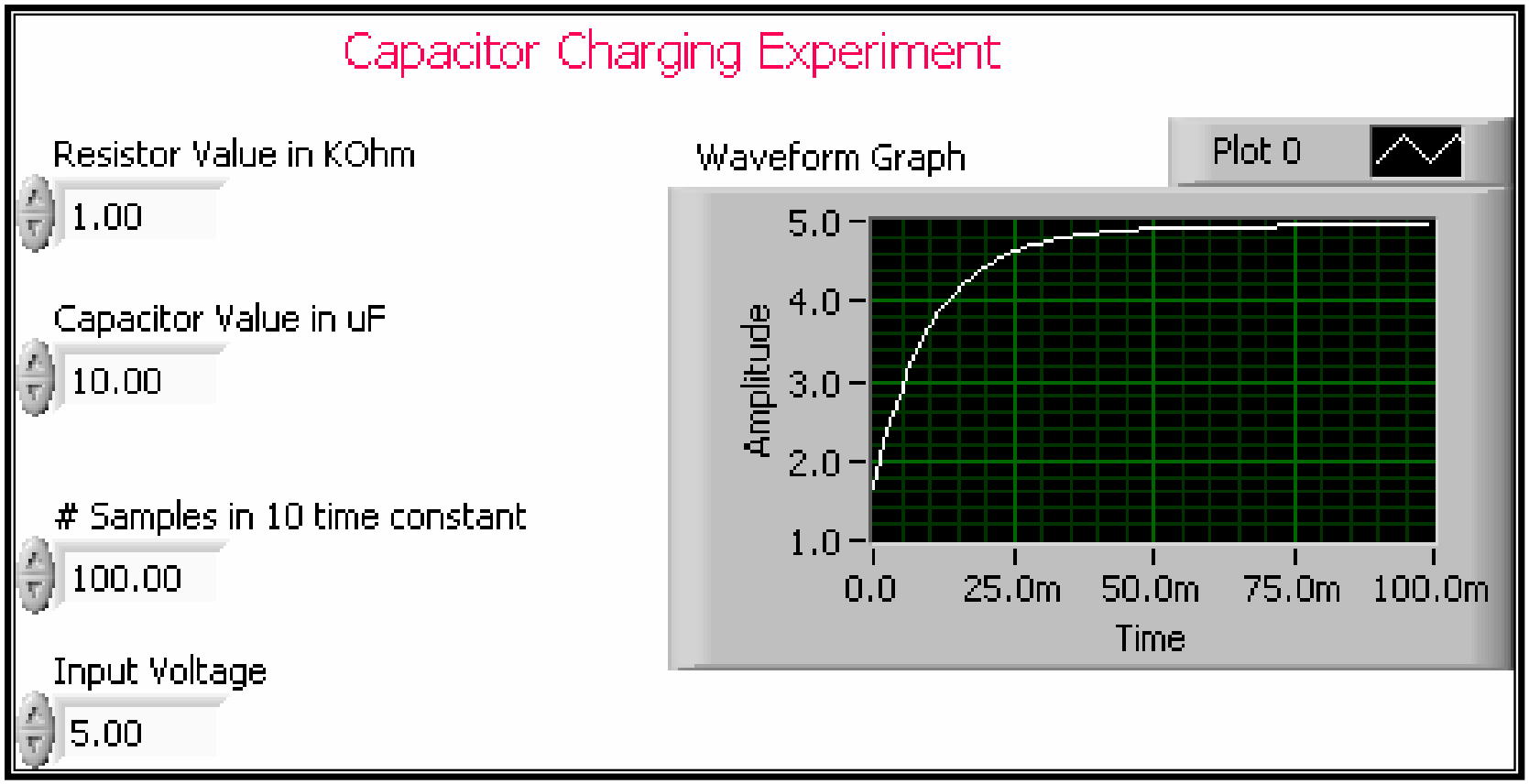
Block Diagram for VI Characteristics



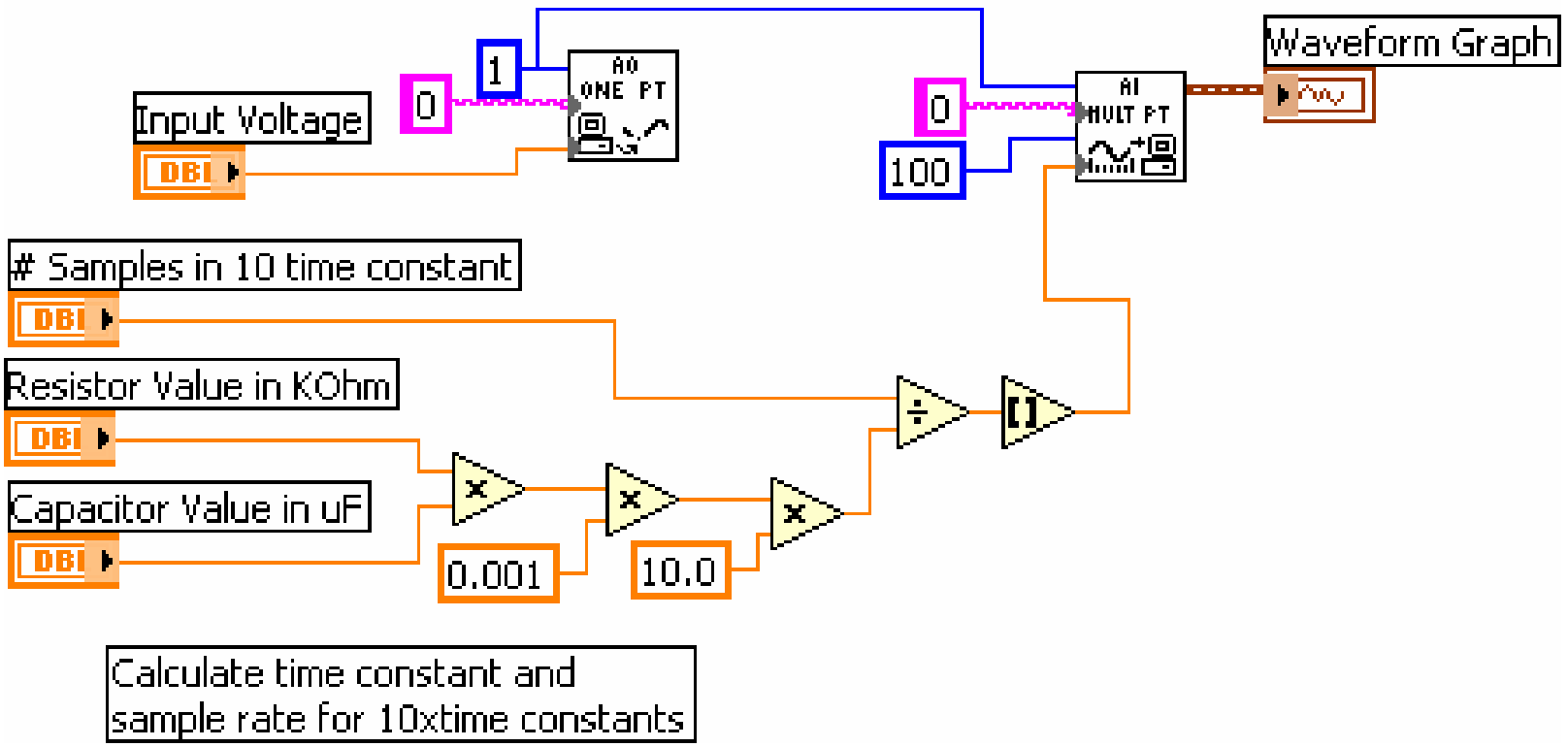
Capacitor Charging Circuit



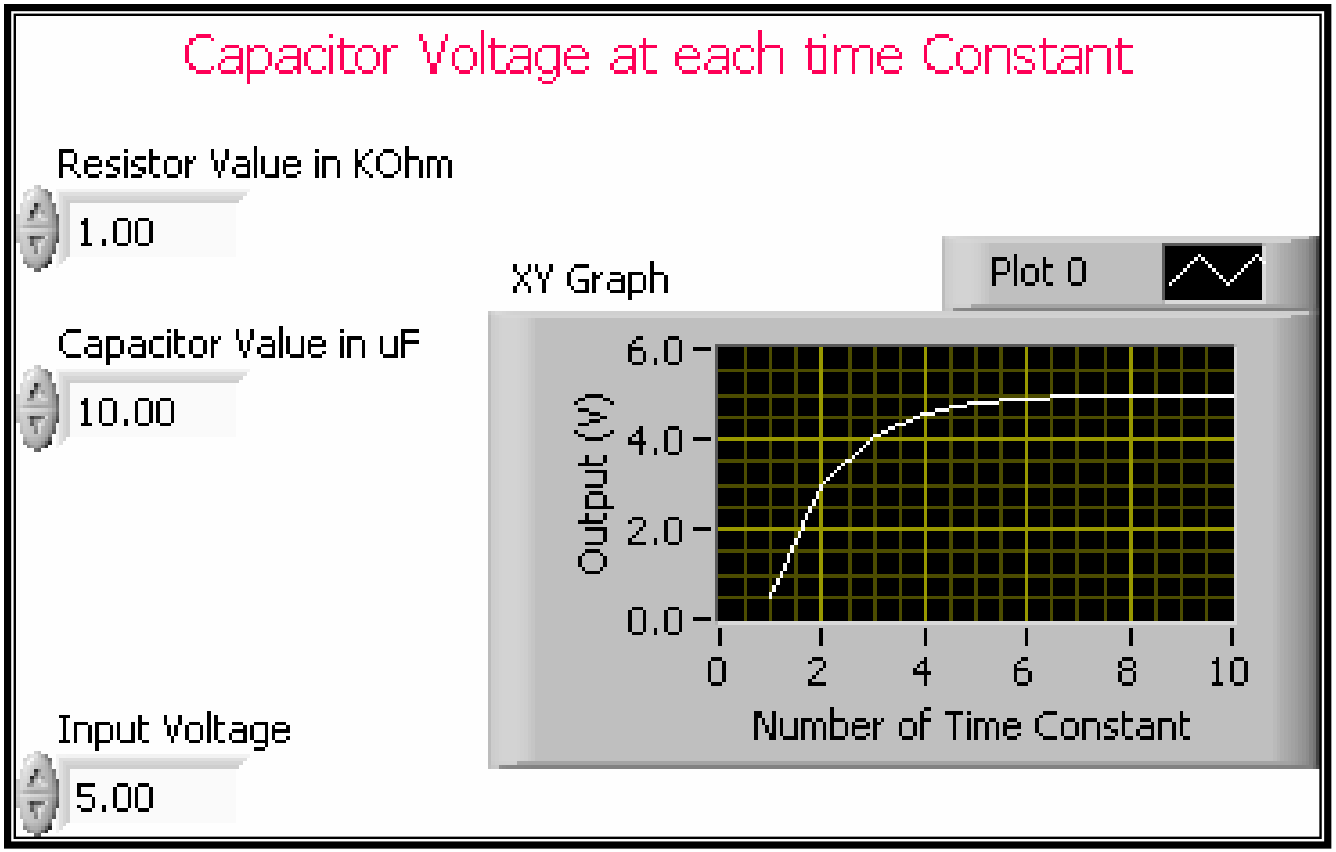
Front Panel for Capacitor Charging



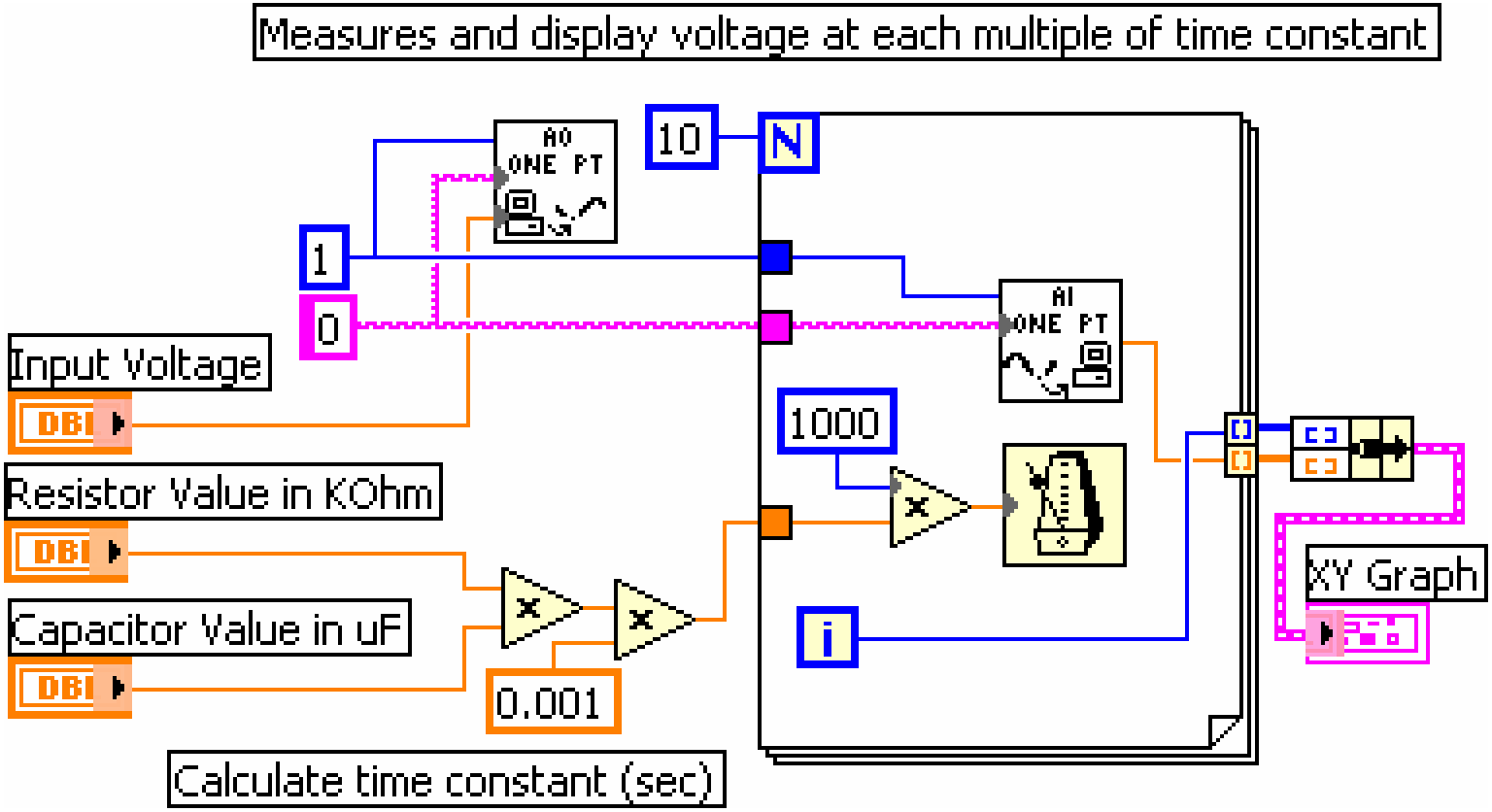
Block Diagram for Capacitor Charging



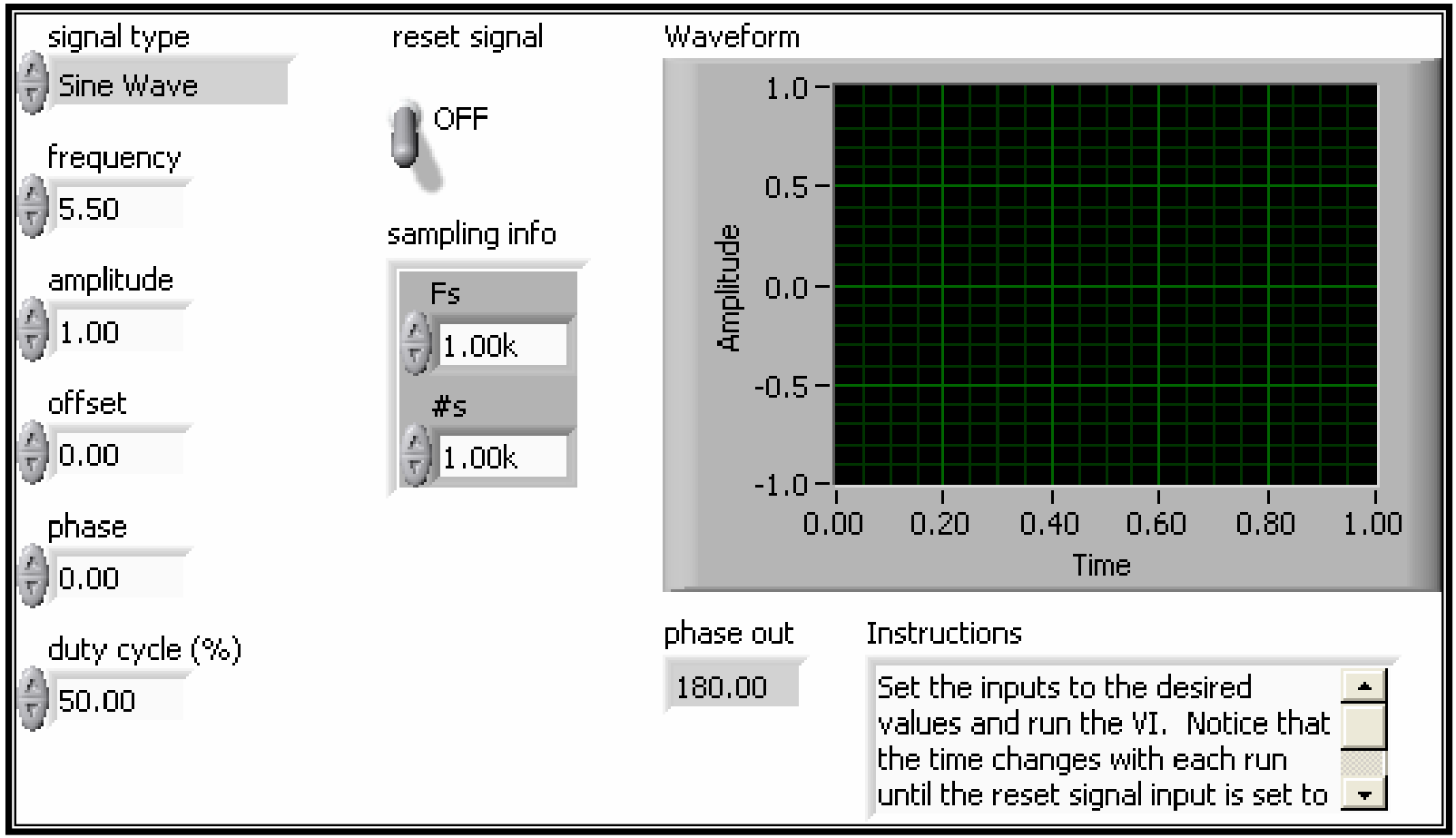
Front Panel: Charging at Time-Constants



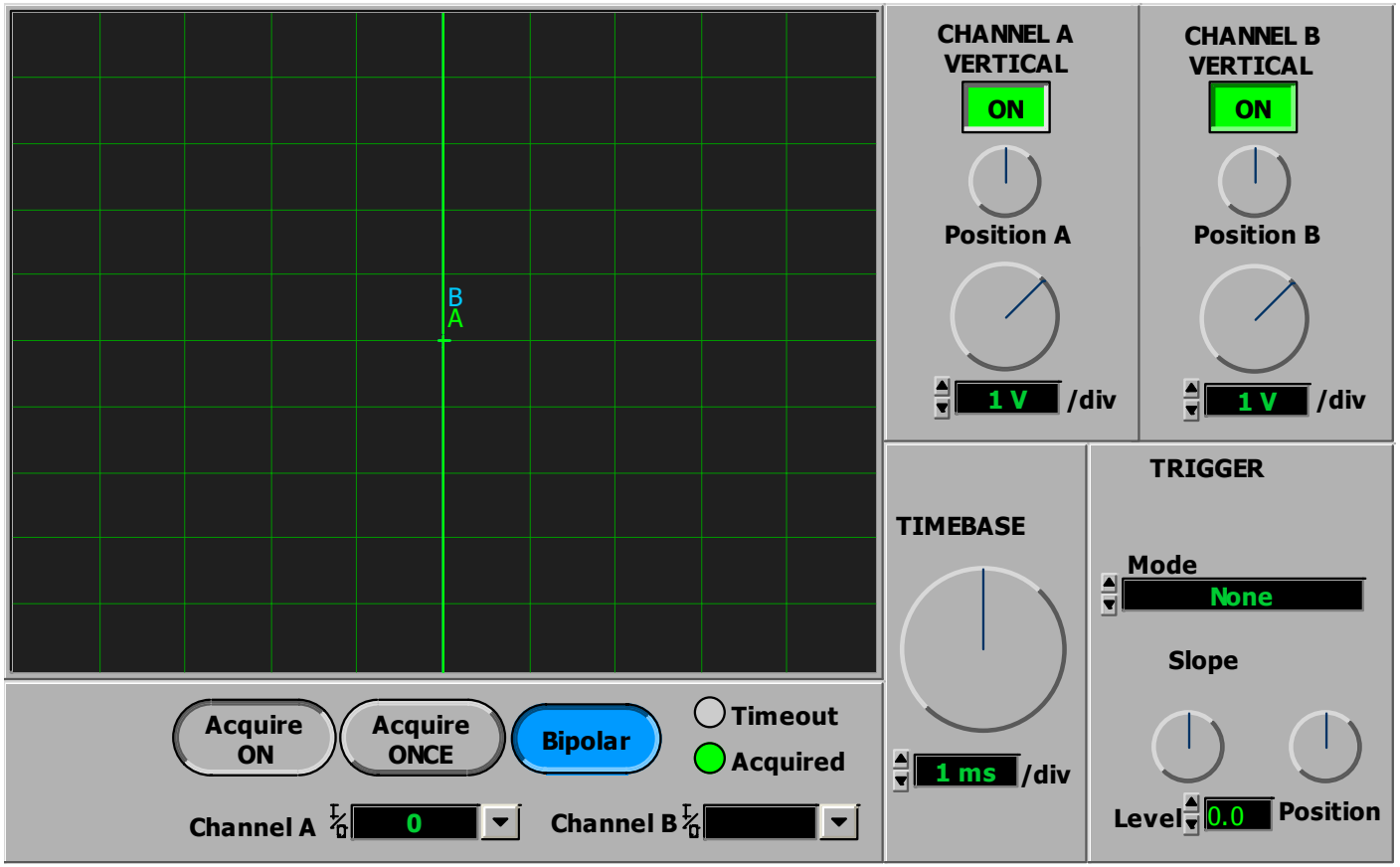
Block Diagram:Charging at Time Constants

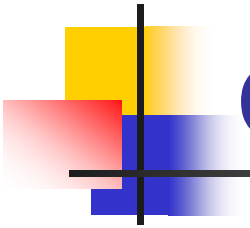


Function Generator Front Panel



Oscilloscope Front Panel





Conclusions

- Virtual lab may replace traditional lab
- Low-cost solutions for Lab experiments
- Offer more flexibility
- Data can be presented in various formats
- Can be accessed via Internet
- Can be extended to develop labs in other areas such as control systems, robotics, etc.