LabVIEW Automation and Coordination of a Multifunctional Measurement System

Electromagnetics and Microwave Laboratory
Dep. of Electrical and Computer Engineering
Texas A&M University, College Station, TX 77840, USA

USRG Student: Binod Karki
Faculty Mentor: Gregory H. Huff

Undergraduate Summer Research Grants (USRG)
Dwight Look College of Engineering
Texas A&M University, College Station, TX 77840, USA

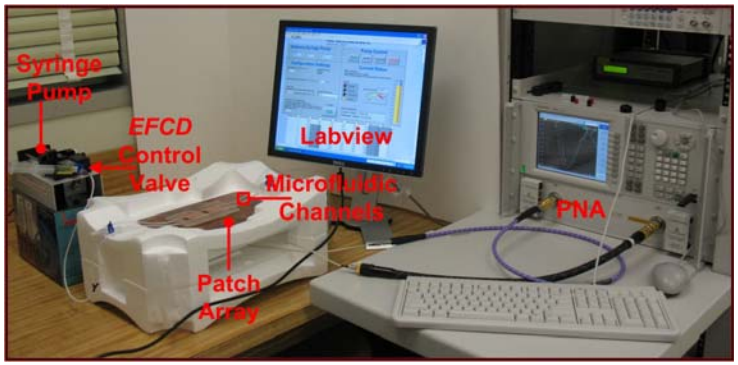
Objective

Coordinate a wide variety of different measurement and instrumentation equipment and products from various vendors to assist in data acquisition and automation

Thesis: LabVIEW and other tools can be used in conjunction with networkable gateways to facilitate remotely controlled automated measurement capabilities of a multifunctional measurement system

Previous Set-Up

Previously connected devices were manual and not automated – no remote connection was available so networked connections could not be established



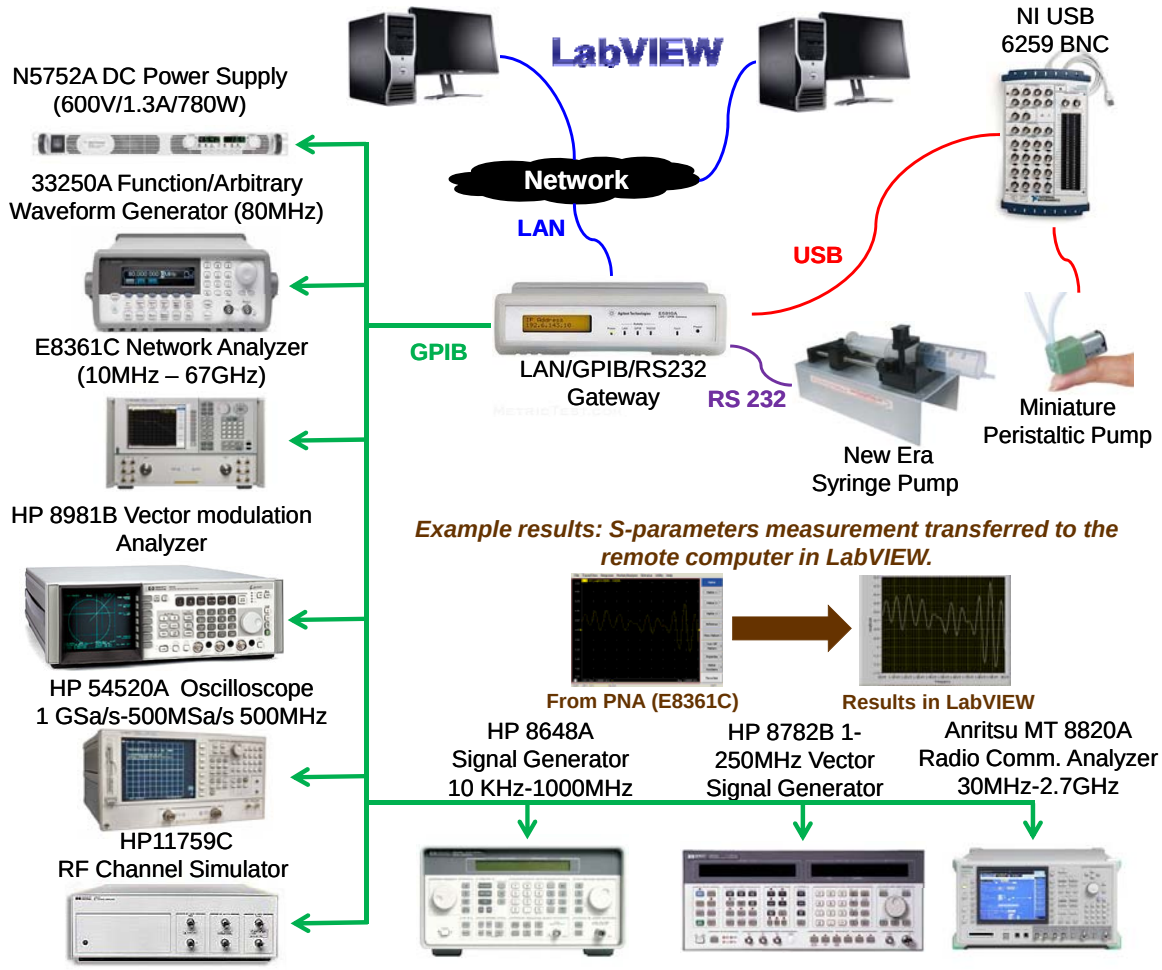
Methodology

VISA is a single library of functions that can be -use to communicate with GPIB, serial, VXI, and computer-based instruments

Step 1: Identify all equipment and determine connectivity requirements
Step 2: Establish LAN connection between gateway and computer via internet
Step3: Test connectivity (e.g., query) between gateway and instruments connected using GPIB, RS 232, and USB connections
Step 4: Add remote VISA interface using NI-MAX and VXI
Step 5: Use LabVIEW as the medium to communicate and extract data

Many difficulties were encounter due to various driver incompatibilities and other hardware related issues – however, communication, control, and data extraction were accomplished remotely for the PNA E8361C (GPIB) and the USB NI6259 (USB)

Current System Configuration



Example results: S-parameters measurement transferred to the remote computer in LabVIEW.

From PNA (E8361C) — Results in LabVIEW

Conclusion

Programming on Visa provides a significant advantage because of it's scalability to be used in serial, GBIP , VXI and other computer-based instruments.

This research demonstrate the ease in using the VISA interface in handling the GPIB, serial, VXI and other computer based instruments. Future work will work in handling multiple devices.

TEXAS A&M UNIVERSITY — *Contact: Gregory H. Huff – Email: ghuff@tamu.edu | Phone: 979.862.4161 | Fax: 979.845.6259* — TEXAS A&M UNIVERSITY