LabVIEW® Control of SANS Sample Environment

Jeff Krzywon

NIST Center for Neutron Research

PROPERTIES

On passing, 'Finish' button:	**Goes to Next Slide**
On failing, 'Finish' button:	**Goes to Next Slide**
Allow user to leave quiz:	**After user has completed quiz**
User may view slides after quiz:	**At any time**
User may attempt quiz:	**Unlimited times**

Properties...

Edit in Quizmaker
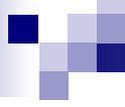
Overview

- Reasons for Changing Software

- Why LabVIEW®?

- Early Issues

- Software In-Use

- Future Projects
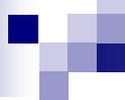
Why New Software?

- Inconsistent and Non-User Friendly
- Legacy Computing
- Future Proofing
  - Forward Compatibility
  - New Controller? Able to Retain Program Architecture
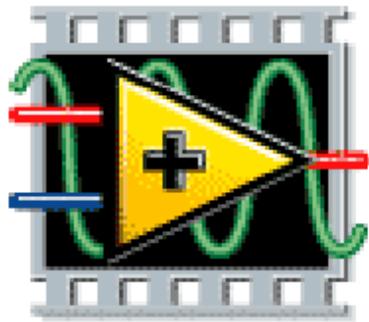
Why LabVIEW®?

- Graphical Programming Designed for Measurement and Automation

- Fast Implementation and Many Preexisting VIs

- Data-Flow Control

Issues

- **Computing and Handshaking**
  - ☐ Legacy Devices – ISA Compatible Cards
  - ☐ Solution: Serial-to-TTL Converter

- **Rheometer**
  - ☐ Proprietary Communication Language
  - ☐ Solution: Do not include in project

Handshaking

- **Two VIs to mimic steps taken by VAX**
    - Check input state and change output state when ready
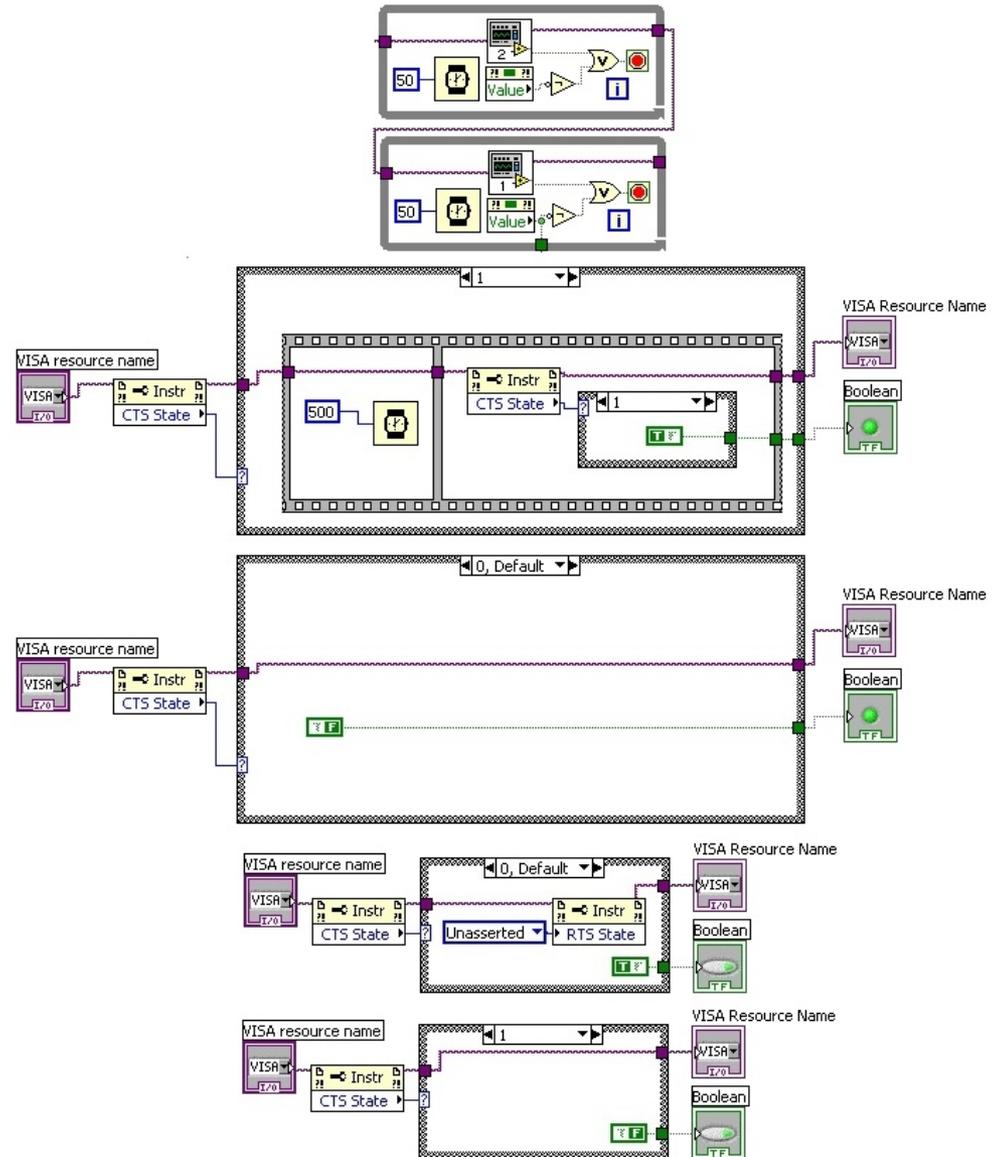
Boulder Shear Cell
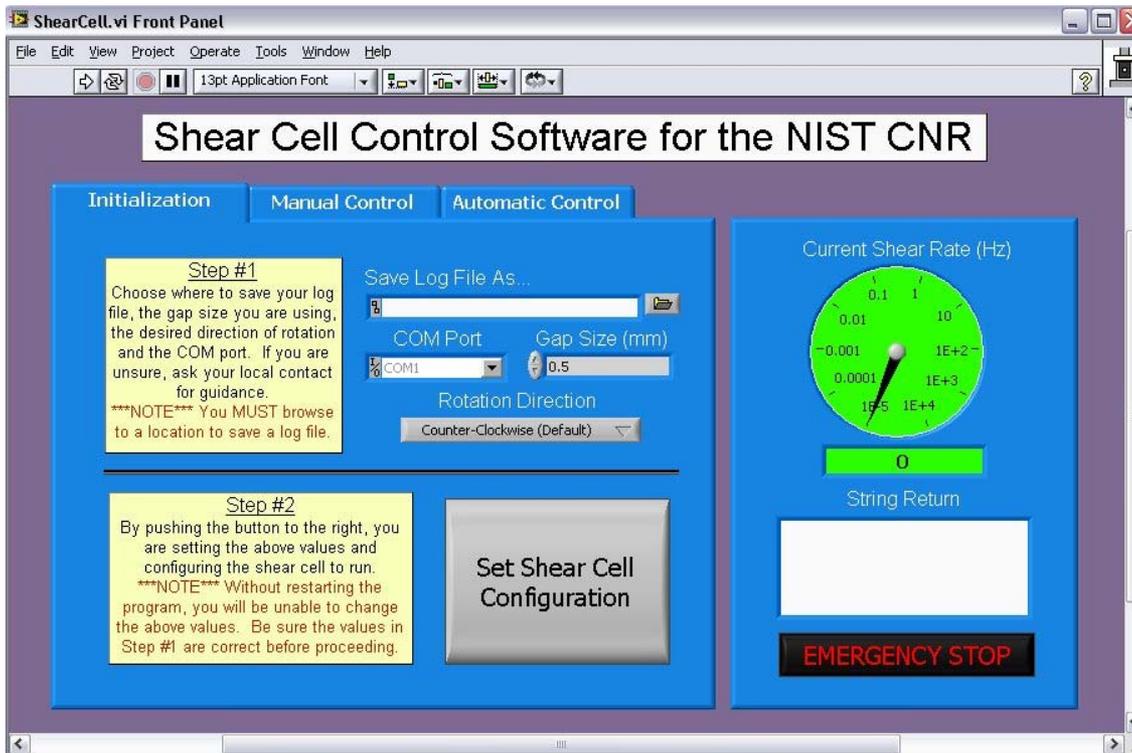
- Parker Compumotor KHX-250 Brushless Servo Motor – ASCII Serial
- Time-stamped, human-readable data log
- Rigid user task flow to limit potential user errors
- Previous software and computers removed from user program

Humidity Chamber

- Eurotherm X26 controller, Omega CN2002 controller and Neslab RTE-140 Circulator
- Direct interface to iTools software

SANS Humidity Chamber Control Panel

Setup | Manual Control | Automatic Control | Errors

Humidity 30.0 %
Sample Temperature 25.0 C
Can Temp Offset 2.0 C

Set Parameters
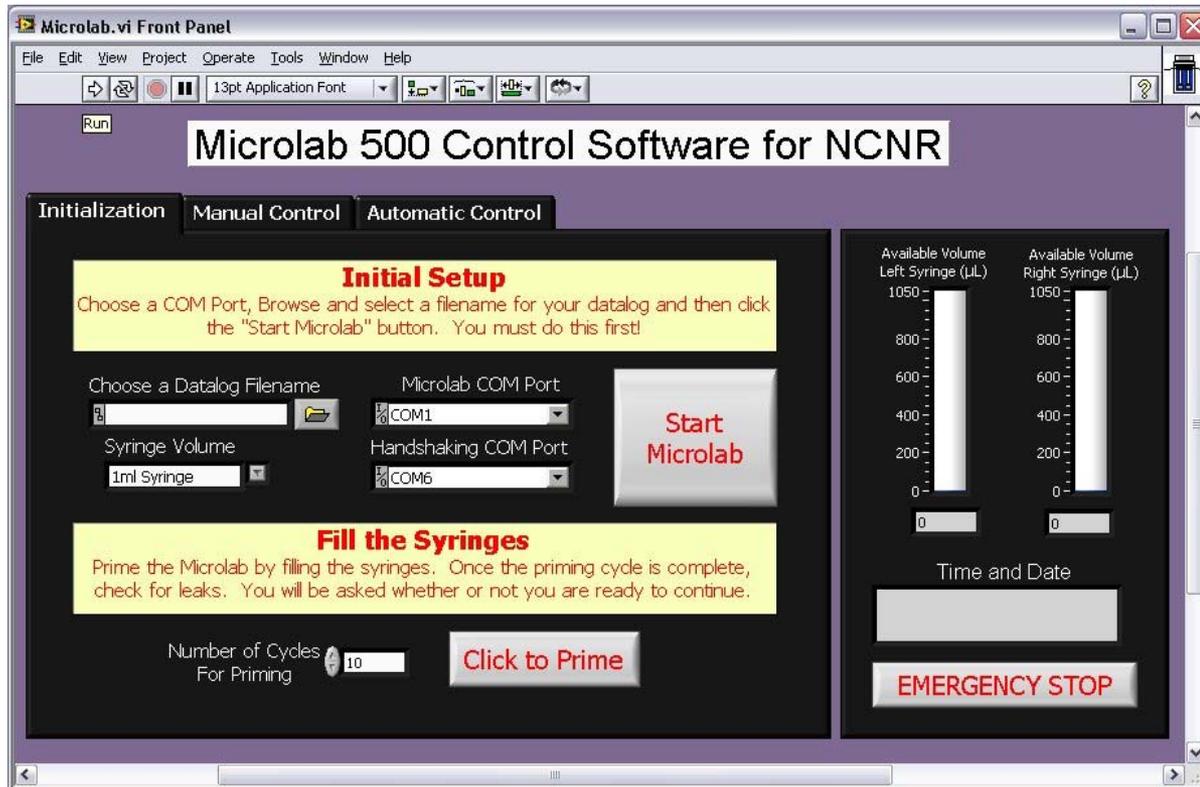
Microlab 500

- Hamilton Microlab 500 Dispenser – ACSII, Serial
- Limited feature set required

Wire Diagram Template
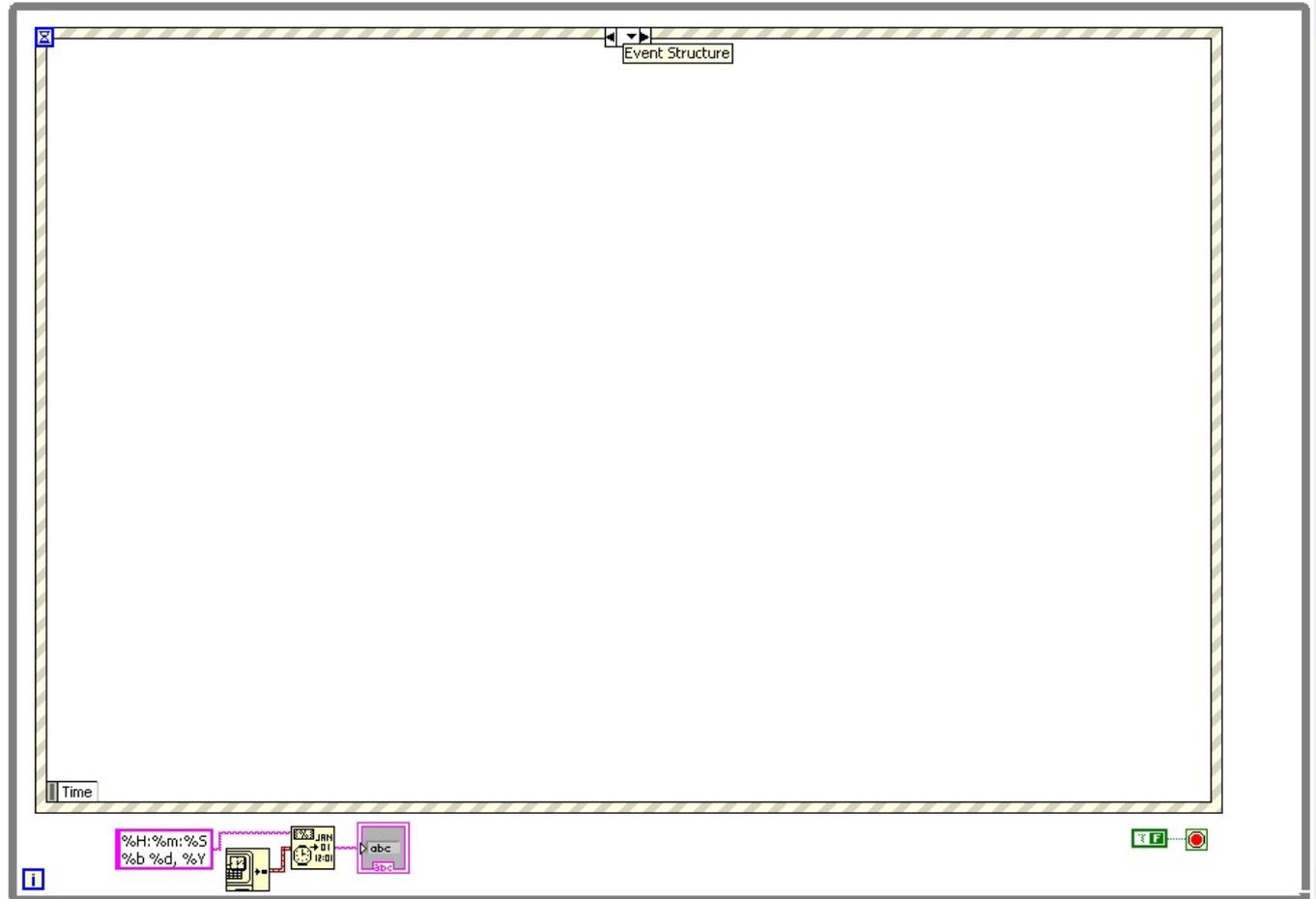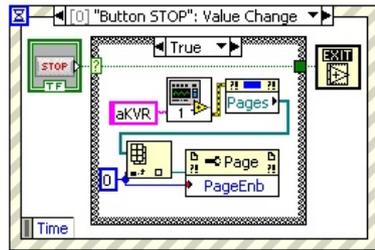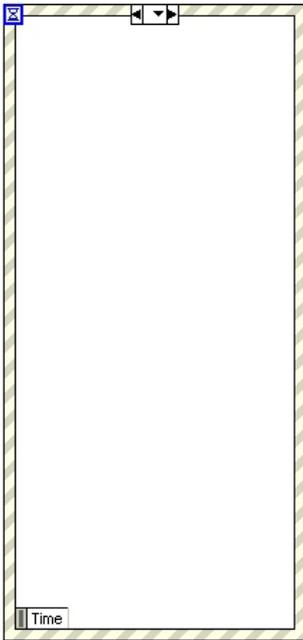
Other Programs and Future Directions

- **Other Small Programs**
  - ☐ Handshaking Tester
  - ☐ RTD Reader
  - ☐ Pressure Rig
- **Future Directions**
  - ☐ Pressure Cell
  - ☐ Others?
  - ☐ ICE