Trials, Tribulations, and Pitfalls Using Commercial Instruments for Data Acquisition

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Abstract

Brookhaven National Laboratory's Relativistic Heavy Ion Collider (RHIC) uses many commercially available instruments – for example spectrum analyzers, oscilloscopes, digital volt meters, signal generators - as integral parts of instrumentation and control systems. Typically these systems are remotely controlled. Using commercial instruments has many benefits. Manufactures have the skill, knowledge, and experience to produce high quality products. The price performance ratio is hard to duplicate. There are also disadvantages. Proprietary interfaces, single platform drivers, and reliable operation provide challenges for implementation and unattended operation. Several of the systems used at RHIC will be described. Their issues and solutions will be presented.

Problem	Solution
Instrument hangs	Remote AC reset
Cyber-security	Kiosk mode
Protocol changes	Design for change

Representative Systems

- Beam current monitor -- high precision digital voltmeter, current source.
- Beam profile monitors – cameras.
- Schottky cavities -- spectrum analyzer, oscillator.
- Polarimeter -- high voltage power supplies, multi-channel digital voltmeter.
- Pulsed power supplies – oscilloscopes.
- Stochastic cooling -- network and spectrum analyzers.
- Vacuum system -- ion gauge and ion pump controllers.
- Wall current monitor -- oscilloscopes.

Window Kiosk Mode

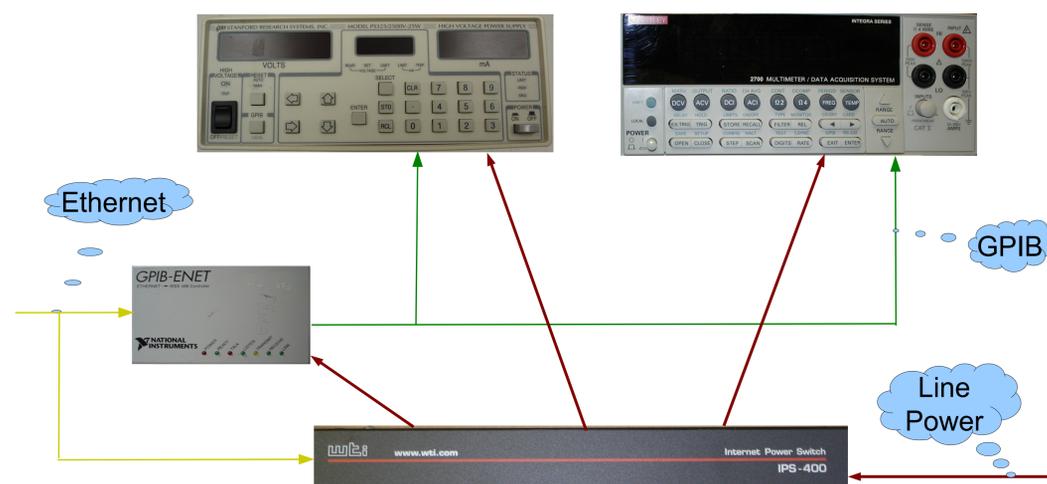1. From an account with administrative rights, create a new account and give it administrative rights as well.
2. Log off and onto the new account you just created. (This account must have admin rights).
3. Open the registry editor by clicking Start – Run – and typing "regedit" in the space.
4. Locate the registry key **HKEY_CURRENT_USER**\Software\Microsoft\Windows NT\CurrentVersion\Winlogon.
5. In the right pane – create a new string value and name it "**Shell**".
6. Change the value for the newly created string to the application executable you wish to solely run on this account including the path.
7. Locate the registry key **HKEY_LOCAL_MACHINE**\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon.
8. In the right pane open the string value "AutoAdminLogon". If it doesn't exist – create it.
9. Change the value of "**AutoAdminLogon" from "0" to "1"**.
10. In the same pane, add another string value called "**DefaultUserName**".
11. Change the value for "DefaultUserName" to the name of the account you created for limited access.
12. Add another string value called "**DefaultPassword**".
13. Change the value for "DefaultPassword" to the password you created for the limited account. If no password was set you can leave this blank.
14. Close the registry editor.
15. Click Start – Run – and type "**gpedit.msc**" in the space.
16. In the left pane expand the key called "User Configuration".
17. Under "User Configuration" expand "Administrative Templates".
18. Under "Administrative Templates" expand "System".
19. Under "System" open the folder called "**Ctrl+Alt+Del Options**".
20. Double click "**Remove Task Manager**" and change the setting from "Not Configured" to "**Enabled**".
21. Close the policy editor.

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