

5 - 32 Network Communicating between IPC and Multimeter Based on LabView

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The output stability of power supply for Heavy Ion Research Facility of Lanzhou (HIRFL) is significant. Power supply provides currents to magnets which produce the magnetic field to constraint particles. So the output stability of power supply has a great significance to the quality of beams. In order to test the stability of power supply, we use a Fluke 8846A digit precision multimeter based on LabView platform of National Instrument Corporation.

Remote operation of 8846A Digital Multimeter from a host, that is a terminal, controller, PC, or computer, is accomplished by sending commands to it through one of its remote interfaces. The Multimeter is controlled remotely using Standard Commands for Programmable Instruments (SCPI), Fluke 45 or Fluke 8842A (8840A and 8842A) commands. The meter can be remotely controlled through the LAN port on the Meter's rear panel^[1]. We can send SCPI commands to the Meter using network communicating controls provided by LabView^[2]. This program could be used to test output stability of power supply of HIRFL.

As shown by Fig. 1 below, we can set loop delays of LabView program to decide sampling frequency, IP address and port of the multimeter in the LabView front panel. There are four measurement types: DC voltage, DC current, AC voltage, and AC current. The real time changes could be displayed by waveform.

In the program block we use four network communicating controls, respectively, TCP Open Connection, TCP Write which could be used to send SCPI commands to the meter TCP read which read data sent by meter, TCP Close Connection. Writing to Spreadsheet File.vi provided by LabView is used to write the data read from the meter to a specified file which could be used doing some plotting and analysis.



Fig. 1 (color online) The LabView front panel.

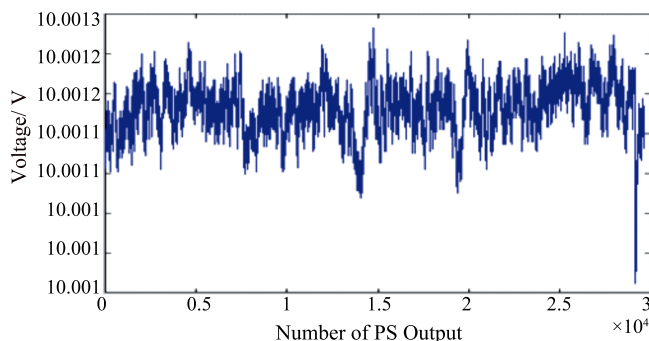


Fig. 2 (color online) Output of power supply controller.

The controller gives a DC voltage to power supply. So in test experiment we measure the output of atmega128 controller, record about 30 thousand data read from the meter and plot the trend using MATLAB as shown by Fig. 2. The precision of power supply controller could be up to 0.000 1.

References

- [1] FLUKE 8845A/8846A Digit Multimeter Programmers Manuals, September (2006), Rev. 3, 3/11.
- [2] Sheng Liu, Lanyong Zhang. Labview 2009 Program Design, (2010).