Lead Acid Battery Charging-Discharging Voltage with Agilent USB Data Acquisition (DAQ) Devices

Application Note

Contents

Battery Charger Test

The lead acid battery is one of the most commonly used rechargeable battery. Lead acid battery has high power density and lower cost. They are widely used in cars, motorcycles and emergency lamps.

One of the advantages of the lead acid battery is that the battery will not degrade as fast as a lithium ion or nickel cadmium battery, even if the battery is recharged half- way through before the power is fully drained. As opposed to those other batteries, the lead acid battery is also capable of going through many charge and discharge cycles.

This application note describes the setup in acquiring the voltage during the charge and discharge operation of the battery.

Battery-Discharging Test Setup

Equipments used in the measurement setup are the Agilent USB DAQ device, lead acid battery, load and power supply (battery charger).

Figure 1 illustrates the setup for the battery- discharging test.

The discharge properties of the battery are obtained by measuring the voltage drop of the load during the switch- on (discharge) and switch- off (open circuit) time interval.

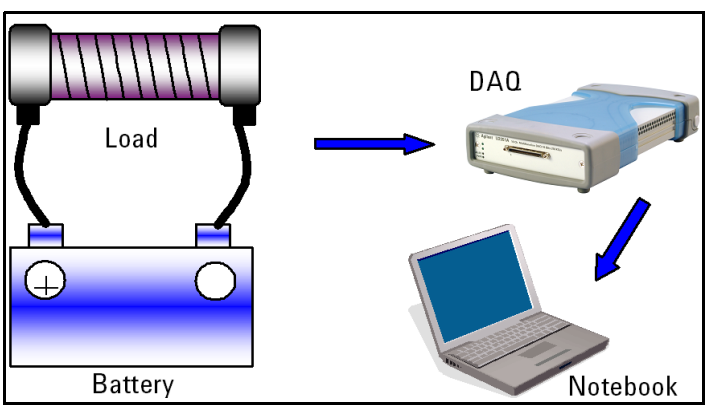

Figure 1 Battery-discharging test setup

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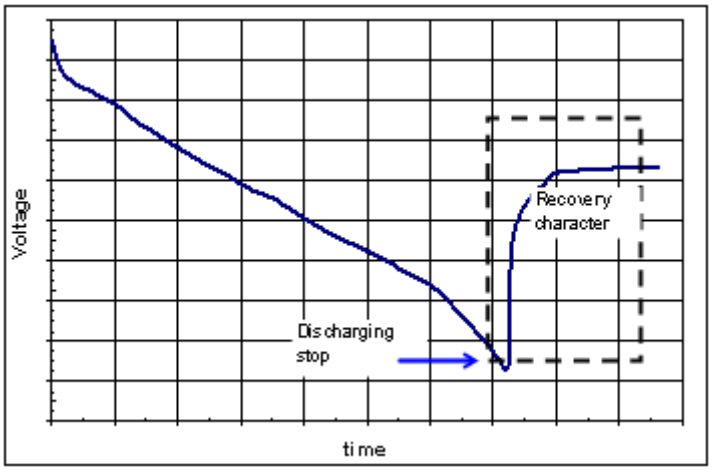

Figure 2 Battery-discharging curve

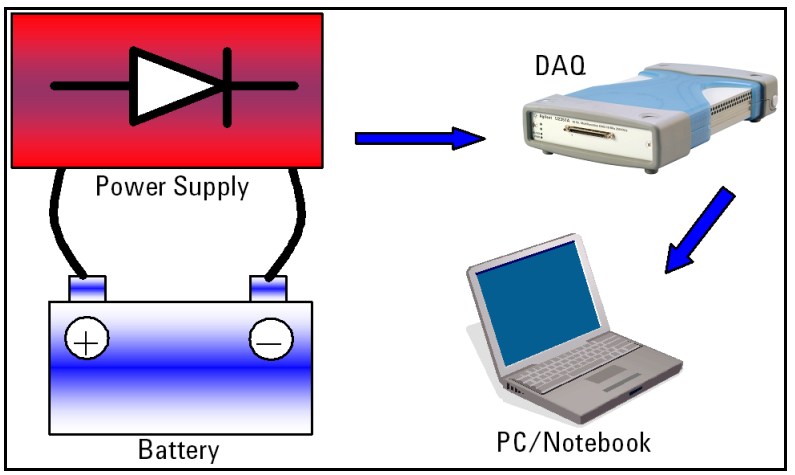

Figure 3 Battery-charging test setup

Figure 2 shows an example of the battery- discharging curve and recovery characteristics from the post- processed data out of the voltage signal supplied to the USB DAQ device.

Battery-Charging Test Setup

In battery- charging test setup, the load is replaced with the battery charger. Similar to the discharge test setup, the charge properties of the battery are also acquired from measurements taken during the switch- on (charging) and switch- off (open circuit) time intervals. The battery- charging voltage is being fed to the DAQ device and recorded in the PC.

Figure 4 illustrates the charging characteristics of the battery. Note that both graphs (Figure 2 and Figure 4) show the recovery behavior after the charging or discharging activity.

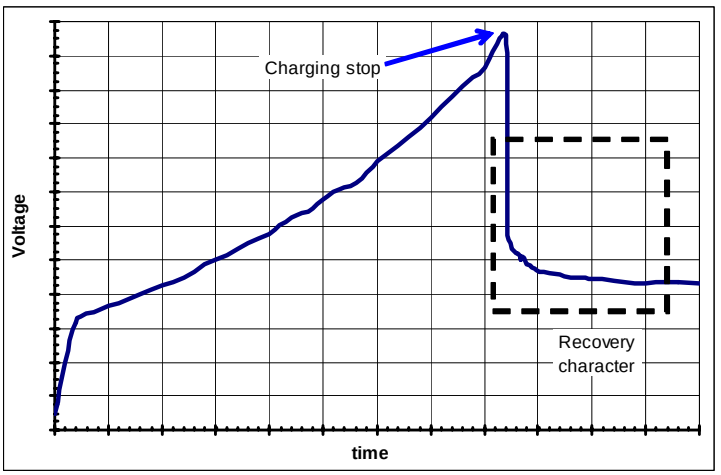

Figure 4 Battery-charging curve

Conclusion

The Agilent USB DAQ device is a cost effective and simple device, giving it the flexibility in PC data acquisition for most applications.

Related Agilent Literature

- *System Developer Guide - Using USB in the Test and Measurement Environment Application Note,* literature number 1465- 12

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