Battery Charger Test using Agilent USB DAQ

Application Note

Contents

Introduction

There are more and more portable devices in the market. Examples of portable devices are cellphones, MP3 players, cordless phones and digital cameras. These devices are more common as they get more inexpensive. In order to fulfill the increasing number of portable devices, more battery chargers are designed. The reliability of a battery charger is important to ensure that it does not over–charge. This prolongs the lifespan of a battery and reduces damages to its internal components.

Battery charger test

A lot of researches have been carried out on the battery itself, leading to an increasing interest in evaluating the performance of a battery charger system as a whole. Figure 1 illustrates the basic block diagram of a battery charger system. The following tests are used in evaluating the performance of the battery charger:

- Discharge mode test
- Charge (or maintenance) mode test
- No–battery mode test

Typical measurements take in the tests are voltage, current and temperature, where you may choose to use digital multimeters and temperature sensors. The number of multimeters or sensors that are needed for measurement depends on the number of measured parameters. This however, is resolved if the Agilent's USB data acquisition device is used instead.

The Agilent USB DAQ device has up to 64 input channels and each module can be fitted into the six slot Agilent modular instrument chassis. This gives a maximum of 384 channels when fitted into the chassis and automatically enables synchronized data measurements. This simplifies the integration of multiple instruments.

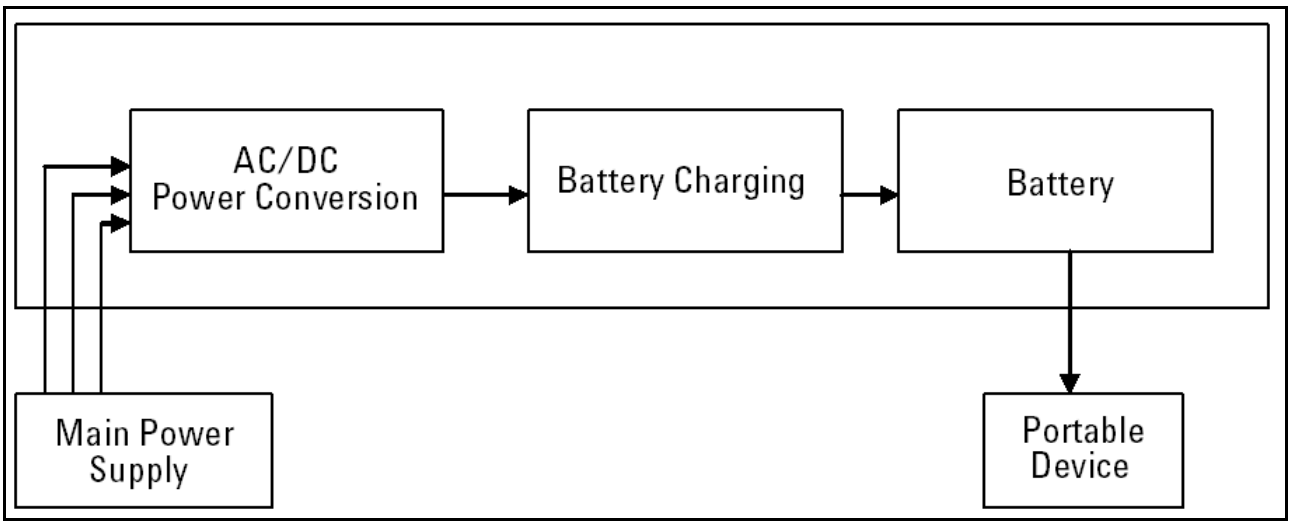

Figure 1 Block diagram of a battery charger system

With sampling rate of up to 3 MSa/s, the performance of signals over short intervals can be monitored over a long period of time. USB is the most common interface in PCs nowadays. This enables low switching and startup cost in this particular test system.

Figure 2 illustrates the block diagram of a test system that is used to evaluate the performance of the battery charging system. The input channels of the Agilent DAQ device are utilized to perform simultaneous measurements of various parameters from the battery charging system. The measured variables are then sent to the PC for further analysis.

The voltage is directly measured by the DAQ device using an analog–to–digital converter (ADC). The current transducer converts the measured current to voltage output before it is sent to the DAQ.

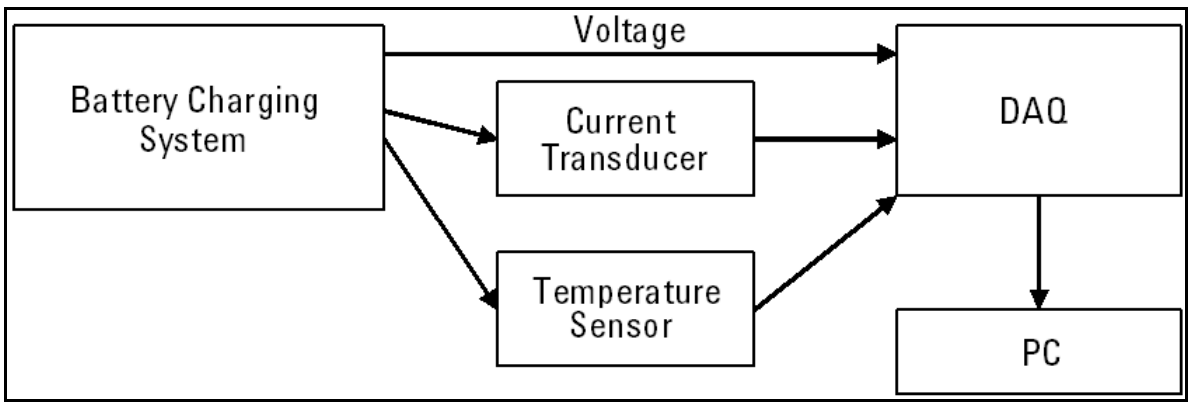

Figure 2 Test system for performance evaluation of battery charging

Conclusion

With the easy solution provided by the Agilent USB DAQ device, test engineers can measure multiple test parameters of battery chargers easily and effectively.

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Related Agilent literature

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

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