Multi-Channel Acquisition

SOLUTIONS

SO0001-EN01A

SIGLENT TECHNOLOGIES CO.,LTD

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1 OVERVIEW

With the continuous expansion of consumer electronics, automotive, IoT (Internet of Things), and industrial automation industries, there is a growing need across sectors for more efficient and cost-effective methods to precisely monitor multiple parameters like voltage and current, thereby enhancing system reliability.

You can easily expand measurement channels by selecting a scan card. This document primarily introduces the rich multi-channel measurement capabilities provided by the SDM4065A-SC and how to control the instrument more conveniently via PC software and visualize data trends more intuitively.

2 CHALENGES

Traditional multimeters typically offer only a single measurement channel. For applications requiring multiple channel measurements, using multiple single-channel multimeters simultaneously is inefficient for data logging and monitoring, especially in industrial production settings. Directly using multiple multimeters to form a multi-channel acquisition system incurs high costs and often requires specialized PC software. A multimeter supporting multi-channel acquisition is indispensable in such scenarios.

3 SOLUTION

The SDM4065A-SC Multi-Channel Data Acquisition System addresses applications involving multi-channel and diverse signal measurements. It provides precise measurement capabilities and flexible signal connectivity for both product performance testing and automated testing during production.

The SDM4065A-SC comprises a multimeter mainframe and a 16-channel scan card. The mainframe delivers outstanding measurement accuracy and rich measurement functions, making it a powerful multimeter. The 16 scan channels include 4 current channels and 12 multi-function measurement channels. These cover DCV (DC Voltage), DCI (DC Current), ACV (AC Voltage), ACI (AC Current), 2WR (2-Wire Resistance), 4WR (4-Wire Resistance), CAP (Capacitance), Frequency, Continuity, Diode Test, and Temperature (Thermocouple and RTD), enabling customers to perform high-precision testing for various application scenarios.

Figure 1 shows a schematic of the SC1016 scan card. The mainframe can be easily expanded to 16-channel testing via relays.

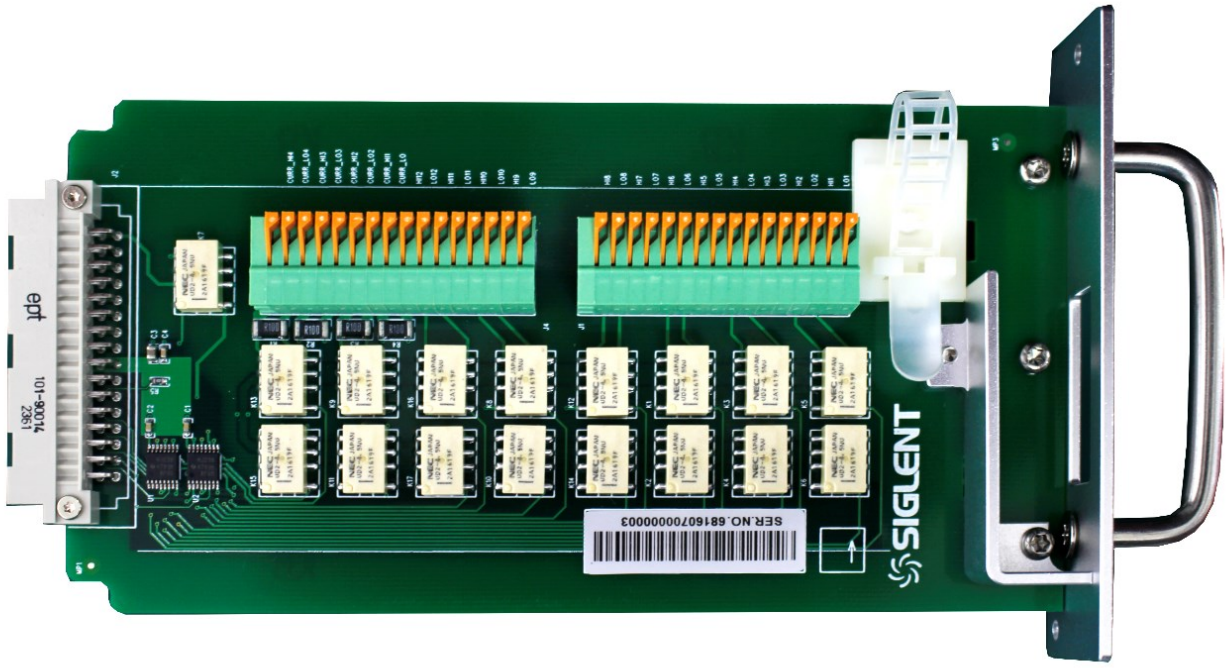

Figure 1: SC1016 Scan Card

Figure 2 illustrates the 2-wire measurement connection method, enabling simultaneous measurement using up to 16 channels.

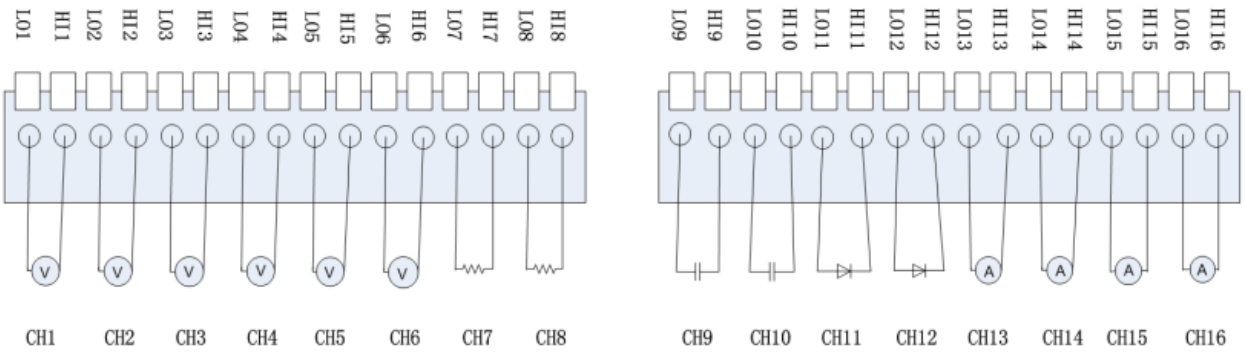

Figure 2: 2-Wire Measurement Method [1] (Voltage, Current, 2W Resistance, Capacitance, Frequency, Continuity, Diode, Temperature)

For higher accuracy requirements in resistance measurement, you can also wire as shown in Figure 3 to perform 4-wire resistance measurements.

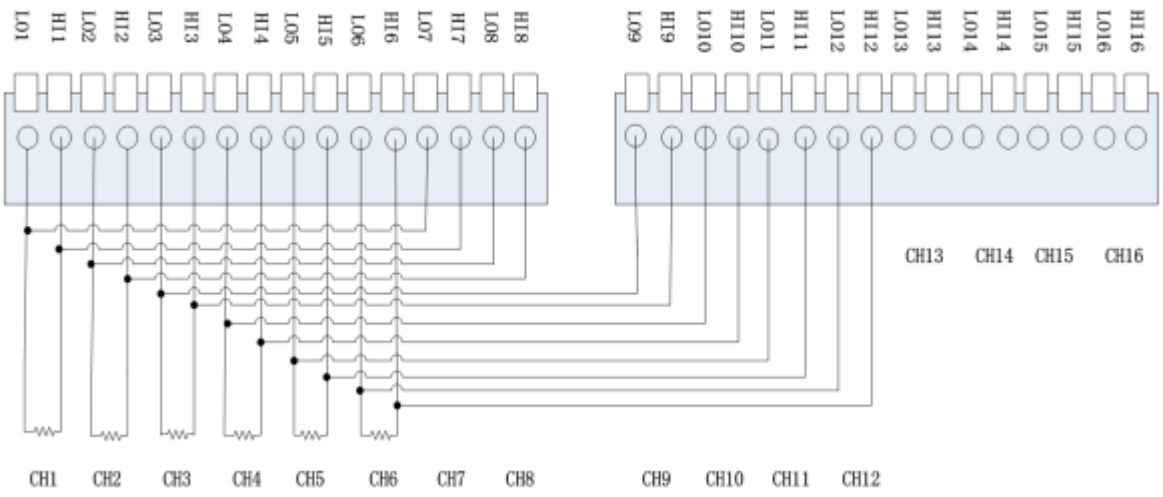

Figure 3: 4-Wire Resistance Measurement Method

Siglent also provides the free PC software EasyDMM-X, shown in Figure 4. It supports connecting multiple instruments and communicating with them simultaneously. Features include saving/loading configurations, exporting data to files for storage, visualizing data trends via graphs, reading multi-channel data from the scan card, and supporting auto-start and auto-stop measurement functions.

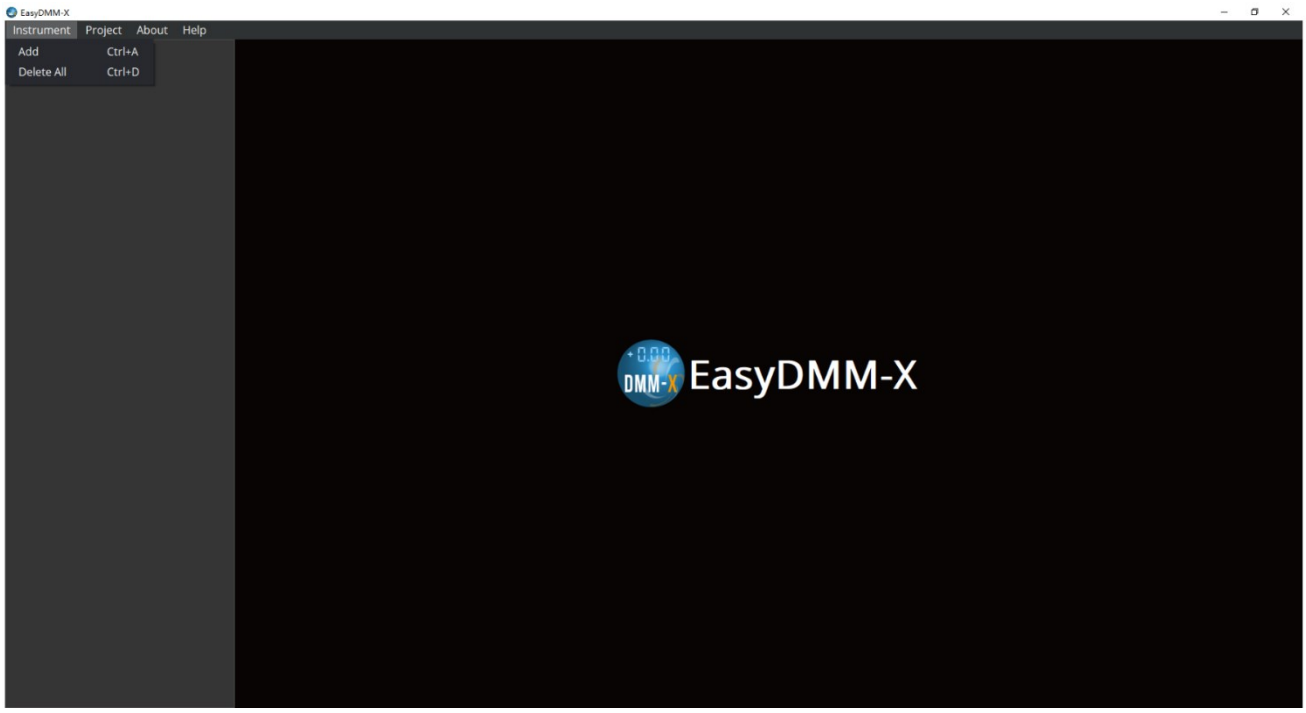

Figure 4: EasyDMM-X

The following describes how to measure 12 channels of data and observe/record multi-channel data using EasyDMM-X.

Procedure:

- Connect the 12 channels according to the wiring diagram in Figure 2.
- Launch the EasyDMM-X PC software, select the corresponding instrument model, and add the

device (supports LAN/USBTMC connection).

- Switch to the Scan Data panel. Configure the settings for the channels required for the test and select the corresponding channels to open.
- At this point, you can choose to scan immediately or schedule the scan to execute at a specific time (see Figure 5).
- After scanning for a period, choose to pause manually or at a specific time.
- Open the Scan Graph panel to observe data trends (see Figure 6) and save the scan data.

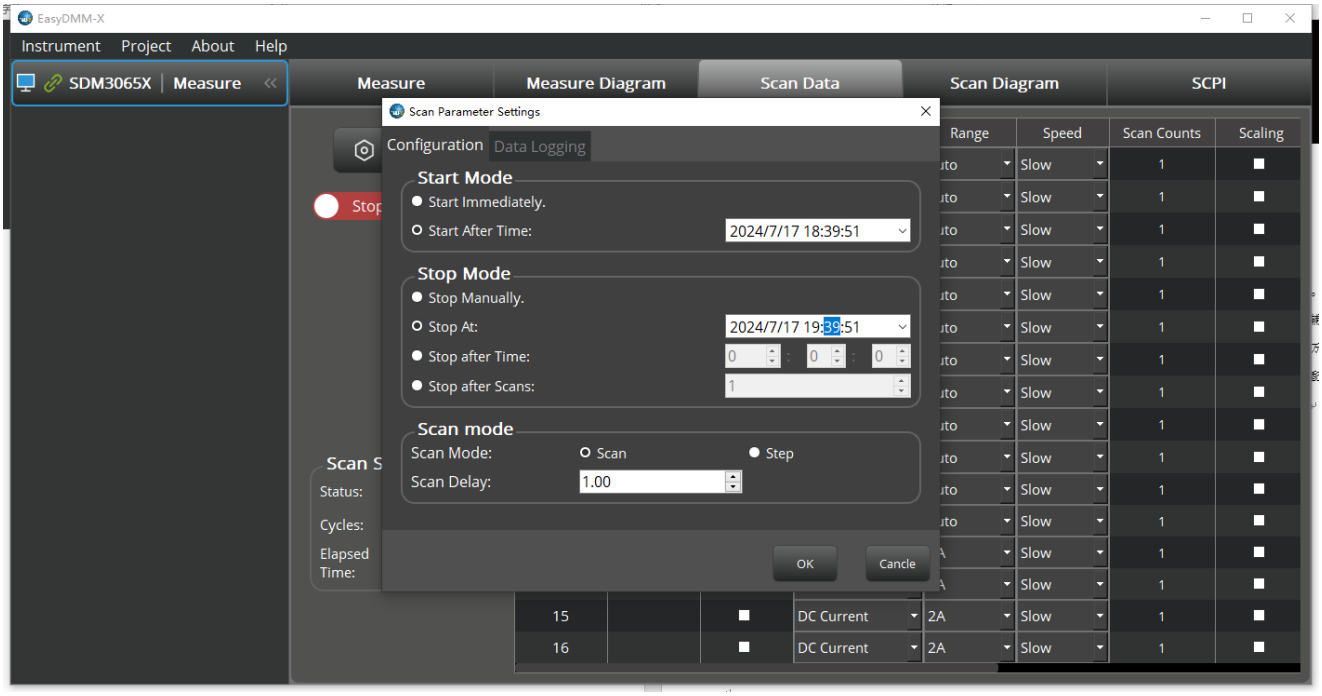

Figure 5: EasyDMM-X Scan Setup

Figure 6: Multi-Channel Scan Card Measurement Results

4 SUMMARY

The SDM4065A-SC provides rich measurement capabilities and outstanding measurement accuracy, successfully extending these functions to the scan card. Via the scan card, users can easily expand the mainframe's single front-panel measurement channel into a 16-channel multi-channel acquisition system. Augmented by Siglent's EasyDMM-X PC software, users can remotely control the multimeter, set up and save different configurations for various test scenarios, easily recall corresponding configuration files for different tests, monitor data trends in real-time using the graphical data panel, and thereby enjoy significant convenience and flexibility.

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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