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Battery Impedance Meter Delivers High Accuracy And Throughput

Tektronix's EA-BIM 20005 battery impedance meter is said to deliver industry-leading throughput, performing electrochemical impedance spectroscopy (EIS) measurements across up to 20 channels (Fig. 1). Designed for seamless integration, it features industry-standard interfaces and a compact design, empowering engineers to enhance accuracy and efficiency in battery testing workflows.

As battery technology rapidly evolves, ensuring the quality and reliability of Li-ion battery cells remains paramount. Battery impedance testing using EIS provides deep insight into cell quality. However, validation and quality assurance engineers operate under intense time pressure, balancing the need for measurement accuracy, high throughput, and battery impedance testing across wide frequency ranges, various states of charge, and thermal conditions, says the vendor.

The company adds that identifying the right instrument is just the first step—seamless integration into existing workflows is crucial to maintaining performance and productivity. The EA-BIM 20005 meets these challenges head-on, setting a new standard for battery testing efficiency, says Tektronix (Fig. 2).

The EA-BIM 20005-10-20 model offers broad-frequency EIS capabilities, with a frequency range from 1 mHz to 10 kHz. This wide range provides significantly more information than fixed 1-kHz systems, allowing for a comprehensive analysis of battery cell behavior under various conditions. The system's ac stimulus can reach up to 10 A (peak-peak), making it suitable for testing cylindrical, pouch, and prismatic cells.

Every EIS channel in the EA-BIM 20005 is accompanied by a high-precision four-wire PT100 temperature measurement channel. This integration allows for simultaneous tracking of impedance and cell temperature, providing a more holistic view of battery performance and health.

The EA-BIM 20005 is equipped with advanced multi-sine stimulus technology, enabling impedance measurements at multiple frequencies simultaneously. This innovation makes the system hundreds of times faster than traditional sweep methods. It can also perform sweep measurements, offering flexibility in testing approaches (Fig. 3). With the ability to test up to 20 channels with fast multiplexing, the EA-BIM 20005 sets a new standard for throughput in battery testing, says Tektronix.

The EA-BIM 20005 comes with included PC software, which simplifies the battery impedance testing process. Users can configure settings effortlessly, evaluate measurements with built-in visualizations and analysis tools, and record results in their preferred file formats. The software supports both standard sweep measurements and rapid multi-sine measurements, catering to various testing requirements. It also allows for measurements under dynamic operating conditions, such as superimposed charging and discharging currents (Fig. 4).

The EA-BIM 20005 features industry-standard interfaces, including a USB device port for PC connection and a CAN Bus for integration into battery cycle automation systems. These interfaces ensure easy integration into custom test programming and existing testing workflows.

With 20 EIS measurement channels in a compact 3U design, the EA-BIM 20005 boasts high channel density, conserving valuable bench and floor space in your testing environment. In addition, its low power consumption (<60 W) eliminates the need for active cooling.

The EA-BIM 20005 battery impedance meter is available for purchase. For more information see the website or contact your local Tektronix Sales Team for details.

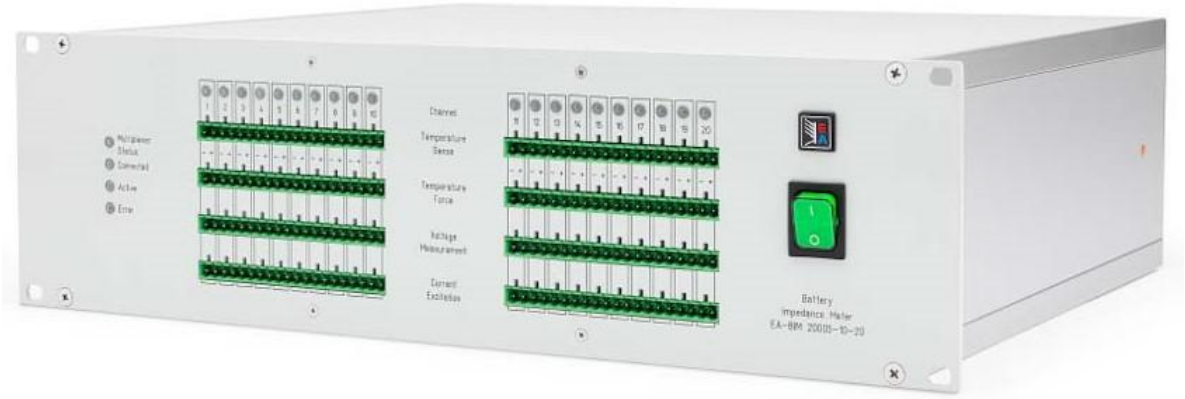

Fig. 1. The EA-BIM 20005 battery impedance meter offers 20 channels for electrochemical impedance spectroscopy (EIS) measurements, plus 20 channels for temperature sensors. By providing fast, accurate insights into Li-ion battery cell quality through high-throughput battery impedance testing, this system enhances the efficiency and reliability of battery testing workflows.

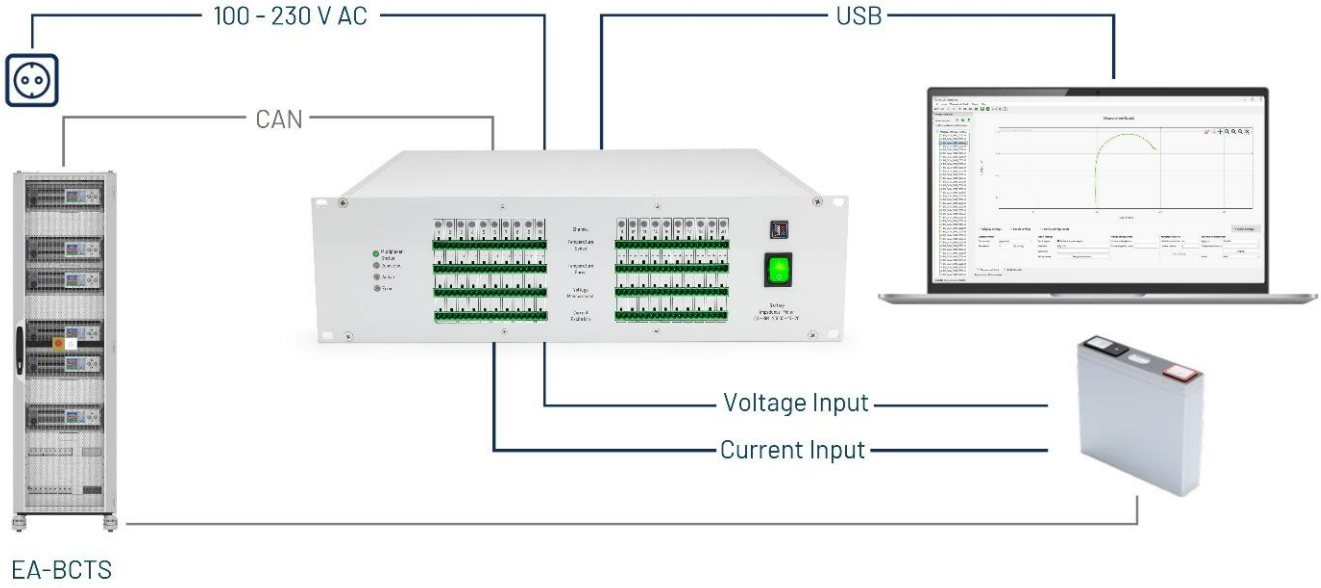

Fig. 2. The EA-BIM 20005 is designed to work seamlessly with cycle testing systems. Its integrated power stage enables the charging and discharging of cells with a current of +/-1 A. For higher currents it can also be used in concert with high-power battery test systems such as the EA-BCTS. Additionally, the system can always remain connected, recognizing the influences of cabling and power stages of battery testers, thus eliminating the need to disconnect/reconnect cables for each test.

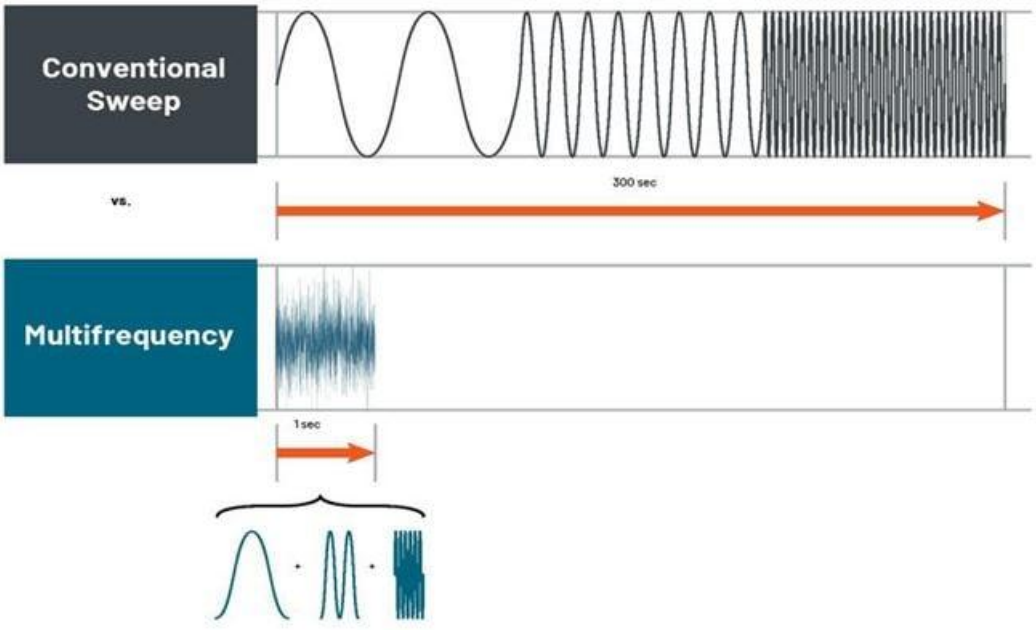

Fig. 3. A conventional swept impedance measurement can take 300 seconds, while an advanced multi-frequency technology measurement performed by the EA-BIM 20005 can be performed in just 1 second.

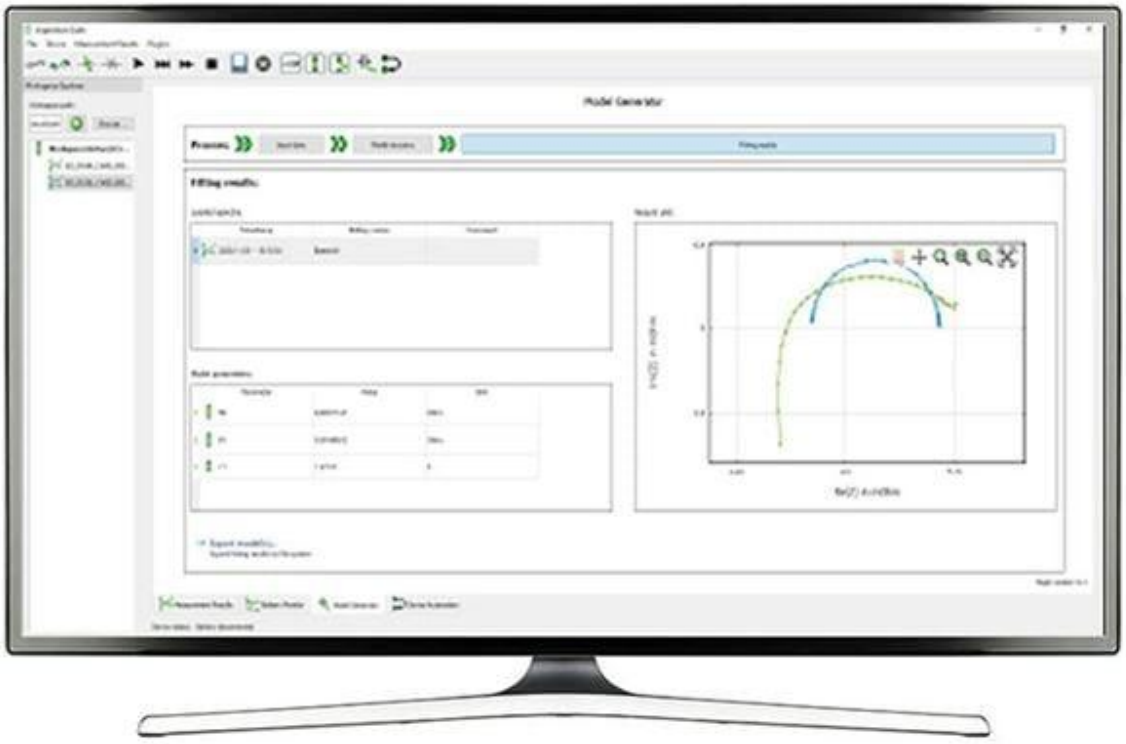

Fig. 4. PC software in the battery impedance meter makes it easy to configure tests and analyze results. The meter connects to the PC via USB.