



Low-Power (< 200 W) Battery Emulation Portfolio

Select the correct Keysight battery
emulation solution for your application

Extend and Validate Battery Life

Keysight BV9211B PathWave BenchVue battery test and emulation software allows you to quickly identify the impact of critical factors on battery life. These factors include determining the battery life impacts of hardware changes, software / firmware updates, ambient temperature, and battery age. You can use these insights to enhance your device's design, extending battery life.

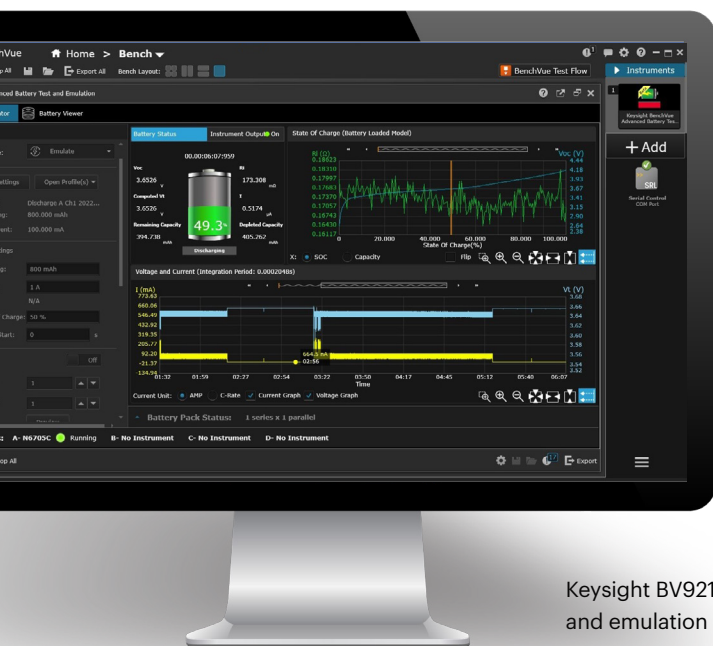
Another benefit of Keysight software is its ability to validate battery life claims by performing run-down analysis and simulating the battery drain of your device.

The software's key functions include the ability to profile and emulate batteries, conduct current-drain analysis, and perform battery run-down and cycle testing. BV9211B software operates on the high-performance Keysight N6705C DC power analyzer and the optimized Keysight E36731A emulator and profiler for lower-power applications. This product brochure will help you pick the correct hardware for your application.

Table 1. Hardware and software solutions

| | Optimized emulation solution | High-performance emulation solution |
|----------|---|---|
| Hardware | E36731A emulator and profiler | N6705C or N6700C modular mainframe N6781A or N6785A SMU module |
| Software | BV9211B PathWave BenchVue battery test and emulation software | BV9211B PathWave BenchVue battery test and emulation software |

Note: The N6705C and N6700C support more than 50 modules that you can mix and match for various testing use cases. Battery emulation is only one of many supported use cases. The E36731A, in contrast, is optimized specifically for battery emulation and profiling.



Keysight BV9211B battery test and emulation software



N6705C



E36731A

Specification and Feature Differences

See Table 2 for the key differences between the optimized and high-performance solutions.

Table 2. Key differences

| | Optimized emulation solution — E36731A + BV9211B | High-performance emulation solution — N6705C or N6700C + N6781A or N6785A + BV9211B |
|--|--|---|
| Key specifications | | |
| Number of channels | 1 channel | Up to 4 channels |
| Maximum power | 200 W | 20 W (N6781A) / 80 W (N6785A) |
| Maximum voltage | 30 V | 20 V |
| Maximum current | 20 A | 3 A (N6781A) / 8 A (N6785A) |
| Measurement accuracy | 14-bit resolution in the uA range | 18-bit resolution in the nA range |
| Key features | | |
| Seamless measurement ranging | No | Yes; useful for dynamic current measurement |
| Digitizer | 100 kHz | 200 kHz |
| Constant dwell arb | No | Yes; 64K pts |
| Canned waveform arbitrary sequence | No | Yes; easily create complex waveforms to simulate or load down a DUT |
| External DataLog | 5 kS/s (200us) | 10 kS/s (100 us) |
| List price | | |
| | 1x | 2x-3x price of optimized emulation solution |
| Additional software support | | |
| Use of BV9201B PathWave BenchVue advanced power control and analysis software to automate the creation of current consumption profiles | No. However, within the BV9211B software, you can create a sample output list based on a device’s current drain measurements. You can use the E36731A or a DMM to capture these measurements. The software can use the sample output list for profiling a battery and run-down testing. | Yes. You can automate the creation of a device’s current consumption profiles using BV9201B software. You can then use these models for profiling a battery and run-down testing with BV9211B software. |

Target Applications

To validate and extend the battery life of low-power devices, you can use either the N6705C power analyzer with a Keysight N6781A / 85 A source / measure unit module or the Keysight E36731A emulator and profiler with BV9211B software. However, the ideal applications for advanced research and development (R&D) testing are different for the two hardware platforms.

The E36731A is ideal for advanced testing of devices with less complex power waveforms (Figure 1), such as Internet of Things (IoT) devices with limited functionality. The E36731A can also support up to 200 W of power for applications such as power tools.

The N6705C is better for applications with complex power states (Figure 2) where its advanced measurement capabilities are important (smartphones, for example). Also, its four outputs are valuable for more advanced applications, enabling you to test up to four subsystems simultaneously with an emulated battery.

Some customers who use the Keysight N6705C power analyzer for advanced R&D testing may find the E36731A profiler and emulator suitable for more coarse-level battery testing.

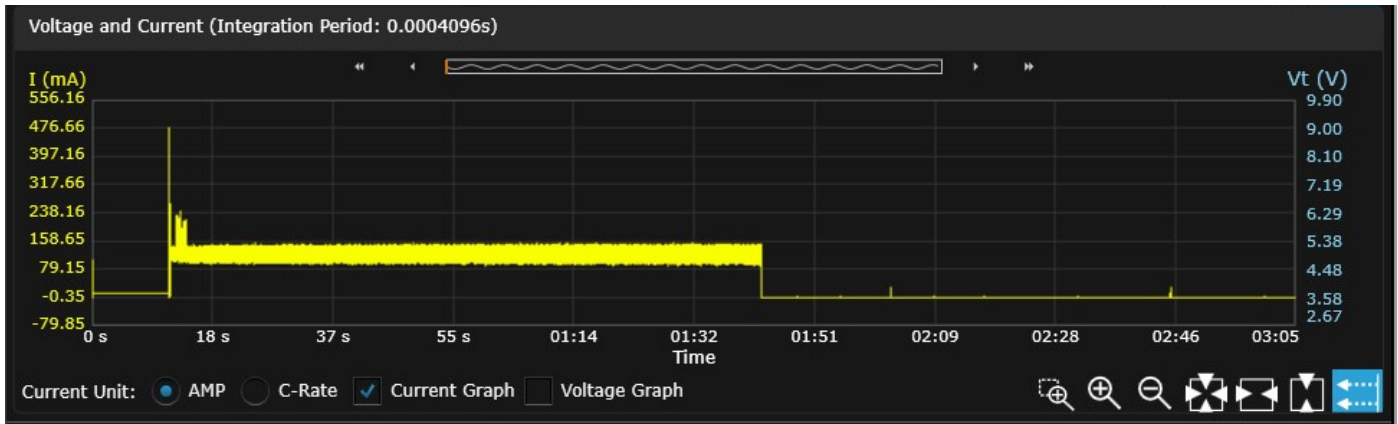


Figure 1. Example application with limited power states

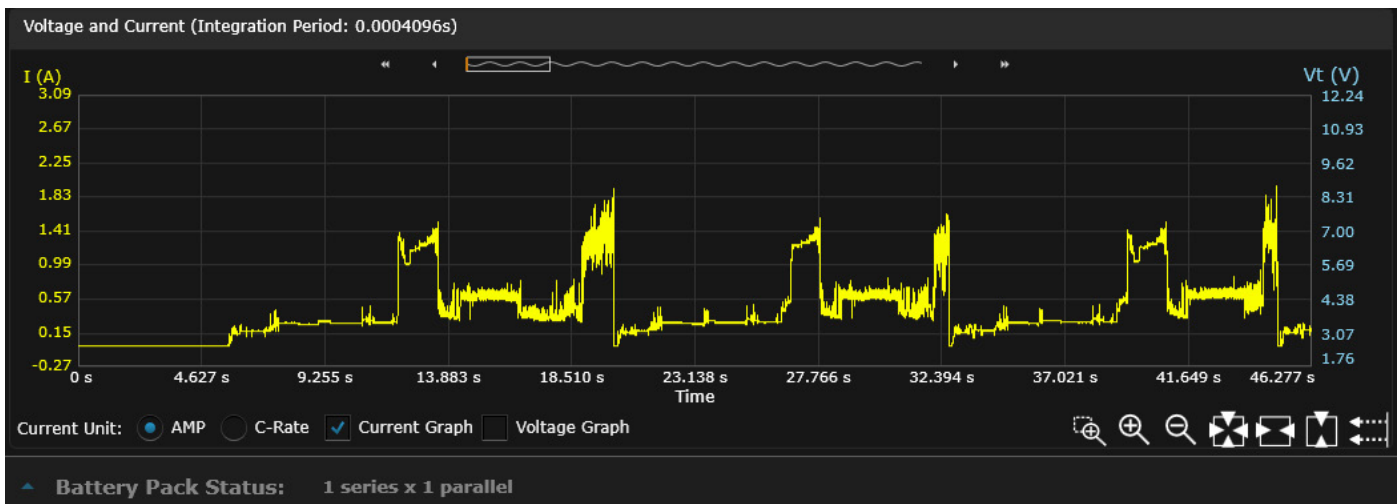


Figure 2. Example application with complex power states

Conclusion

BV9211B battery test and emulation software is a powerful solution that can significantly enhance your device's battery performance. Minimizing battery drain can accelerate innovation, enabling smaller designs and IoT categories. As shown above, Keysight offers a hardware portfolio that works with BV9211B software so you can pick the right solution for your low power application needs.

Additional information

- White paper: [4 Ways to Enhance Battery Performance and Insight with Emulation Software](#)
- Video: [Validate and Extend Battery Life of Mobile and IoT Devices](#)
- [N6705C product page](#)
- [E36731A product page](#)



Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.