EVALUATION ENGINEERING
For Electronic Test & Measurement

FAQ

Programmable Power Supplies Put Advanced Tech Energy Devices to the Test

What is driving demand for programmable power supplies?

Quite simply, much of today's economy depends on modern power electronics. Industries and consumers want quicker, more mobile electronics and mechanical devices. So there is continuing momentum to replace traditional gas powered or plugged-in devices with battery power.

What are the leading applications/markets for your bidirectional power supplies?

The shift to renewable energy sources is a big factor in demand, and in particular the growth in the market for electric vehicles, for which Elektro-Automatik's EA-PSB 9000 and 10000 programmable power supplies are uniquely suited. There's also renewed interest in fuel cell development, the continued growth in other markets such as IT systems, and the overall rebound in the manufacturing industry. The equipment used to test advanced technology must also be advanced, as well as flexible and responsive. Manufacturers need to simulate real world conditions and ensure that their equipment will continue to operate even in the most adverse environments.

What is unique about incorporating a power supply and regenerative electronic load in a single power supply?

Traditionally the charging of a battery would be done using a programmable DC power supply, while the discharging would be done with an electronic or resistive load. Today the bidirectional, regenerative power supply can perform both tests. All models incorporate two devices in one: a power supply (source) and an electronic load (sink) with energy recovery. The PSB bidirectional programmable DC power supply series from Elektro-Automatik can seamlessly switch between providing power to charge the battery and controlling the discharge of the battery. EA offers regenerative electronic DC loads that are an eco-friendly solution that converts supplied DC energy into AC and feeds it back into the local or public grid. This is especially relevant to companies that are developing renewable energy products. Conventional electronic loads convert energy into heat that must be dissipated into the testing area, which makes for uncomfortable working conditions, can require expensive cooling systems, and results in tremendous energy. Test engineers much prefer to work with power supplies that don't get hot.

What are the economic advantages of energy recovery using your power supplies?

EA's PSBs can route energy back into the electrical grid at 96% efficiency. Depending on utilization rate, this regenerative capability can provide payback in under two years. EA PSBs are more environmentally friendly and the dramatic reduction in heat output improves working conditions for greater productivity. EA's power supplies also feature high power density so our customers are able to test a greater range and don't have to go out and buy another unit simply because they are developing a new product with high power consumption or a new configuration with different voltage and current requirements. Additionally, all of EA's DC power supplies feature true auto-ranging, which automatically offers increased current at lower voltages, and vice versa, so customers can test more products with the same unit. The series EA-PSB 10000 bidirectional power supplies offer 30 kW of rated power in only 4U chassis, about a one-third space saving compared to older products, and our customers can test as high as 2000 volts with that product.

What are the advantages of utilizing optional water-cooling systems?

Our water-cooled options are ideal for clean room environments where you don't want fans stirring up particulates and for environments like oil drilling where equipment can be damaged by sand or similar materials. These are also suitable for customers working with heat-sensitive products, as generated heat gets carried away by the water.

These power supplies can be stacked to operate in parallel. How many units can be stacked and who needs that capability?

Our customers can operate with as many as 96 units in 8 racks, running in parallel with one acting as the control unit. Conventional products might have six or seven operating in that manner, so that is a significance advantage for customers who require up to 2 megawatts of power. These stacked units are available in turnkey racks, fully wired and ready to go, so the customer just has to bring in AC input and they are up and running. They are highly suited for testing multiple products.

What are the operator benefits of the PSB series interface controls?

EA was one of the first to provide a touchscreen interface and the PSB series of bidirectional DC power supplies feature 5" TFT touch panel displays for intuitive control, setup and programming utilizing damage-resistant Gorilla Glass. The intelligent interface is standard across our product line so operators don't have to learn a new interface and allows them to configure and test quickly without the need for extensive manual review. The PSB series come standard with an arbitrary waveform function generator, swappable digital interface control and built-in test routines for battery test, photovoltaic simulation and MPP tracking, among others. By implementing an operational curve that mimics a specific battery type, a test engineer can accurately reproduce battery power to test those devices that provide charge to or receive energy from the battery. EA's Battery Simulator software makes it possible to simulate both lead-acid and lithium-ion batteries including their electrical and chemical characteristics during charge or discharge. EA PSBs can simulate a battery that's discharging and then charging back up, which is highly desirable in electric vehicle development, and simulate a power curve. Manufacturers can also simulate batteries when testing a charging station, for example, without actually having to hook up batteries.