



Elektro-Automatik



CASE STUDY:

INNOVATIVE TEST TOOLS BUST THROUGH ROADBLOCKS TO HIGH-POWER LEAD-ACID BATTERY MANUFACTURING

Triple-output, high-power testers help battery manufacturers solve power-density and efficiency issues while saving floorspace and accelerating production.



Terra Supreme Battery LLC

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BACKGROUND

Located in Albion, Indiana, [Terra Supreme Battery LLC](#) manufactures high-quality Group-31 batteries. Group-31 lead-acid batteries measure 13 in. (L) x 6.81 in. (W) x 0.44 in. (H). Capable of enduring rugged and harsh environments, group-31 batteries deliver high-power levels and can handle deep discharges and recharge efficiently.

Terra Supreme Battery's primary market is the production of batteries for microgrids that power military communications systems. Their secondary markets include commercial trucking, cell-tower backups, marine applications, remote outposts, and solar and wind power collection. Terra Supreme Battery is also growing its portfolio for aircraft and military-marine applications.

Instead of the traditional absorbent glass mat (AGM) approach to manufacturing, Terra Supreme Battery employs a bi-polar approach, which enables higher power when necessary. At the heart of this approach is the company's lead-infused glass fiber woven mesh, which makes its batteries more efficient, powerful, and less harmful to the environment. The Terra Supreme battery uses 40% less lead than AGM batteries.

CHALLENGE



Terra Supreme Battery is in the process of a major expansion. Moving into a new building, the company required equipment to support its new products and technological growth.

Achieving the company's desired level of quantity, quality, speed and efficiency using traditional testers and battery-simulation tools presented numerous challenges, including:

- Inability to test multiple units
- Insufficient output power
- A time-consuming process
- Energy inefficient
- Took valuable floor space

SOLUTION

A highly efficient, cost-effective solution

Through various trade contacts, Terra Supreme President Nick Busche and CTO Benny Jay met with representatives from EA Elektro-Automatik (EA). EA's representatives introduced Busche and Jay to the EA-BT 20000 series, a high-power, regenerative-efficiency battery tester. They suggested a 42U rack with seven triple-output BT 20360-80 units that provide 20 channels of battery formation and a 24U rack with three BT 20060-1000 triple-output units for high-current testing.



Triple-output EA-BT 20360-80

The EA-BT 20000 series battery testers are unique in the industry as they offer triple output models and the highest power density.

The EA-BT 20360-80 offers three auto-ranging channels and can perform both charge and discharge. Occupying a mere 4U rack space, the BT 20360-80 specifies an operating voltage from 0 V to 360 V, delivers up to 80 A of output current, and an output power of up to 1 kW per channel (± 30 kW maximum). This resolves three issues:

- It eliminates the need for multiple single-channel testers (cost savings/production boosts)
- It offers the high-power densities required by group-31 battery applications
- Provides a compact 4U footprint to free up lab space

High-density power is a significant benefit for manufacturers who are limited in space. For example, four BT20360-80s take up just one and a half times the space as one of Terra Supreme's single output systems.

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Other benefits of the BT 20360-80 include:

The need for speed. Like all EA-BT 20000 series testers, the BT 20360-80 reads and processes commands with a transmission speed of 1 ms. Working with up-to-date versions of EtherCAT, CAN FD and Gbit Ethernet interfaces can boost throughput further, translating into significant production gains.

Efficiency and sustainability. The BT 20360-80 is regenerative, an extremely important and attractive feature. In the discharging mode, it feeds energy back into the local grid with an efficiency of up to 96.5%. This leaves heat dissipation around 3.5%, significantly reducing air-conditioning and other utility bills.

Versatility. In addition to voltage and current measurement, the BT 20360-80 can handle a wider range of applications. These applications include simulating batteries as single cells, modules or packs. Another benefit is determining the state-of-health (SoH) for a second-life classification and end-of-life testing.

EA ADVANTAGE

In a follow-up meeting with Terra Supreme Battery, EA representatives discussed how EA's modular approach enables:

- Multiple testing options through the use of the triple-channel BT 20360-80 and BT 20060-1000
- Significant equipment savings and greater production output through multiple channels, higher power density and high-speed throughput
- Significant utility and air-conditioning cost savings through regenerative efficiency
- Frees up a significant amount of floor space

RESULT

Higher production with significant cost savings

Based on EA's initial proposal—a 42U rack with seven BT 20360-80 triples providing 20 channels of formation and a 24U rack with three BT 20060-1000 for high current testing—it became clear that Terra Supreme could form up to 20 batteries and test up to nine batteries simultaneously within far less space than the company's existing equipment.

Using EA's [Elektro-Automatik ROI Calculator](#), Terra Supreme could potentially realize a 98% reduction in power consumption and a total yearly power consumption savings of approximately \$151,000.



Based on the projected boost in production and reduced utility and air-conditioning costs, Terra Supreme decided to double the formation channels and move forward immediately. EA is set to deliver and commission the new systems again and provide comprehensive support afterward.

More details and specs are available on the [EA-BT 20000 Triple overview page](#). Also, learn more about EA's rapid, competent and reliable [product support and service](#).



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At the headquarter in Germany in the industrial centre of North Rhine Westphalia more than 300 qualified associates, in a facility of 21000 m², research, develop and manufacture high-tech equipment for laboratory power supply, high power mains adaptors and electronic loads with or without power feedback. The sales network includes branches in China and USA, sales office in Spain and an extensive partner network.

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