

What is a Smart Cell?



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Empowering devices with edge processing is an industry trend that brings advanced capabilities out of centralized servers or services and into the devices themselves, making them more capable, responsive, and secure. While battery cells aren't interactive objects in the same way smart home tech or smartphones are, bringing intelligence to every cell to create "Smart Cells" equips them with individualized power control, intelligent capabilities, and data security advantages.



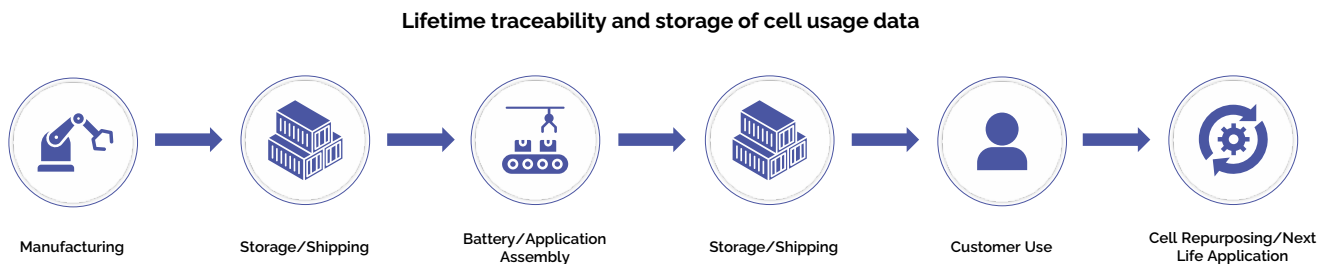
Smart Cells can unlock next-generation battery designs that bring a wealth of new features to improve performance, increase safety and extend battery life, whether it's for electric vehicles or battery energy storage systems. Therefore, adopting Smart Cell technology can set a cell or battery manufacturer apart in an increasingly competitive market.

Manufacturing advantages

The [Dukosi Cell Monitor](#) with onboard memory and processing puts intelligence on every cell, creating Smart Cells. If installed during cell manufacturing, the moment the cell is first charged the Cell Monitor comes to life, actively reading and recording the temperature and voltage of the cell without the need of additional test equipment. This allows easy, immediate identification of any cells that don't meet quality standards, improving manufacturing yield, efficiency, and safety.

Storage and shipping

A Dukosi enabled Smart Cell is self-powered and its status can be checked at any time during storage and shipping, greatly improving supply-chain trust, reducing storage, shipping and insurance costs, and boosting safety. Using a contactless reader to check the Smart Cell's status, unnecessary shipping of bad cells can be avoided. This can provide cost savings of up to 79% when shipping known-good cells*, helping to improve overall profitability.



Extended functionality and value

A Smart Cell not only makes status information available whenever required, it can extend the cell's capability with additional features and functionality. The ability to install value-adds helps differentiate cells in the highly competitive market, providing unique features such as additional sensors for pressure or gas monitoring, data encryption, edge processing of critical data, lifetime provenance information, embedded manufacturing, materials and regulatory information, or much more. Extensibility can meet the needs of a greater variety of industries and applications, as small-scale customizations can be cost-effectively replicated to have large net effects at battery scale.

From battery-level management to cell-level management

Dukosi is bringing battery management system (BMS) functionality into each cell, with its chip-on-cell technology and innovative cell monitoring solutions that will create simpler, safer and smarter high-power batteries. Cell-level data capture and even edge processing of SoX calculations can effectively enhance battery lifetime performance as it enables more fine-grained data, and cell control, while also enhancing safety through mechanisms like alerting cells whose performance and/or environment goes out of specification or outlier detection.

Embracing a feature-rich cell monitoring solution creates platform intelligence that transcends the battery – enabling next-generation designs like virtualized/zero BMS batteries in software-defined vehicles, empowering more effective digital twins, and streamlining next-life uses as cells can be extracted and reused repeatedly until recycling, minimizing their carbon footprint.

Dukosi Cell Monitoring System (DKCMS™)

The [Dukosi Cell Monitoring System](#) brings intelligence to every cell, creating a battery of Smart Cells that can accurately and synchronously capture voltage and temperature of all cells in the pack, take temperature readings in up to three places, and is flexible and scalable to suit specific application requirements.



Whether installed during cell or battery manufacturing it offers advantages that can enhance performance, safety, reliability and longevity of the battery, not only in its first application, but into next-life uses as well, enabling a circular economy.

**Dukosi market research*

Dukosi Ltd develops revolutionary technologies that dramatically improve the performance, safety, and efficiency of battery systems, and enable a more sustainable battery value chain. The company provides a unique cell monitoring solution based on chip-on-cell technology and C-SynQ® communication protocol for electric vehicles (EV), industrial transportation and stationary battery energy storage markets.

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