

Lithium-Ion Battery Learning System, LabVolt Series 8010-N

The fundamentals of efficient Li-ion battery management

FESTO



Highlights

- Compact workstation
- Ready-to-use course materials
- Easily expandable and customizable
- Software-based instruments for real-time monitoring
- Battery charger emulator
- Built-in battery management system (BMS)

Lithium-ion (Li-ion) batteries have a wide range of applications, including portable devices, renewable energy systems, and electric vehicles. Due to their sensitivity to overcharging, overheating, and deep discharge, mastering battery management systems is essential for ensuring their safe and efficient operation.

Your challenge

Despite their apparent simplicity, Li-ion batteries are difficult to work with. Building a training system from scratch can be time-consuming, unpredictable, and risky. Without proper safeguards, structured experiments, and reliable monitoring tools, students may miss important learning objectives, such as learning how to handle them safely, understanding the charging process, and grasping in-depth energy management.

Our solution

The 8010-N enables safe, hands-on experiments with Li-ion batteries in a classroom-ready environment.

Your benefits

- Experiments under a variety of battery conditions
- Consistent, repeatable experiments for reliable results
- Practical skills directly applicable to electric vehicles, renewable energy storage, and power electronics

Learning objectives

- Learn safe handling and operation of lithium-ion batteries.
- Monitor voltage, current, temperature, and state of charge (SOC).
- Control parameters affecting charger performance.
- Balance lithium-ion cells using the four-quadrant method.
- Apply charge and discharge techniques with an integrated BMS.

Learners work in a safe environment that tolerates mistakes and use digital tools to maximize learning.

Solution overview

The courseware

The course “Lithium-Ion Batteries” (sold separately) guides learners step by step through the theory and practical experiments using the 8010-N. It is available in digital format on → Festo LX, as a PDF, or as a printed workbook.

The hardware

The Lithium-Ion Battery Pack module is at the core of the system and features a Battery Management System (BMS) that monitors key battery parameters and controls protective relays and cell-balancing circuits.

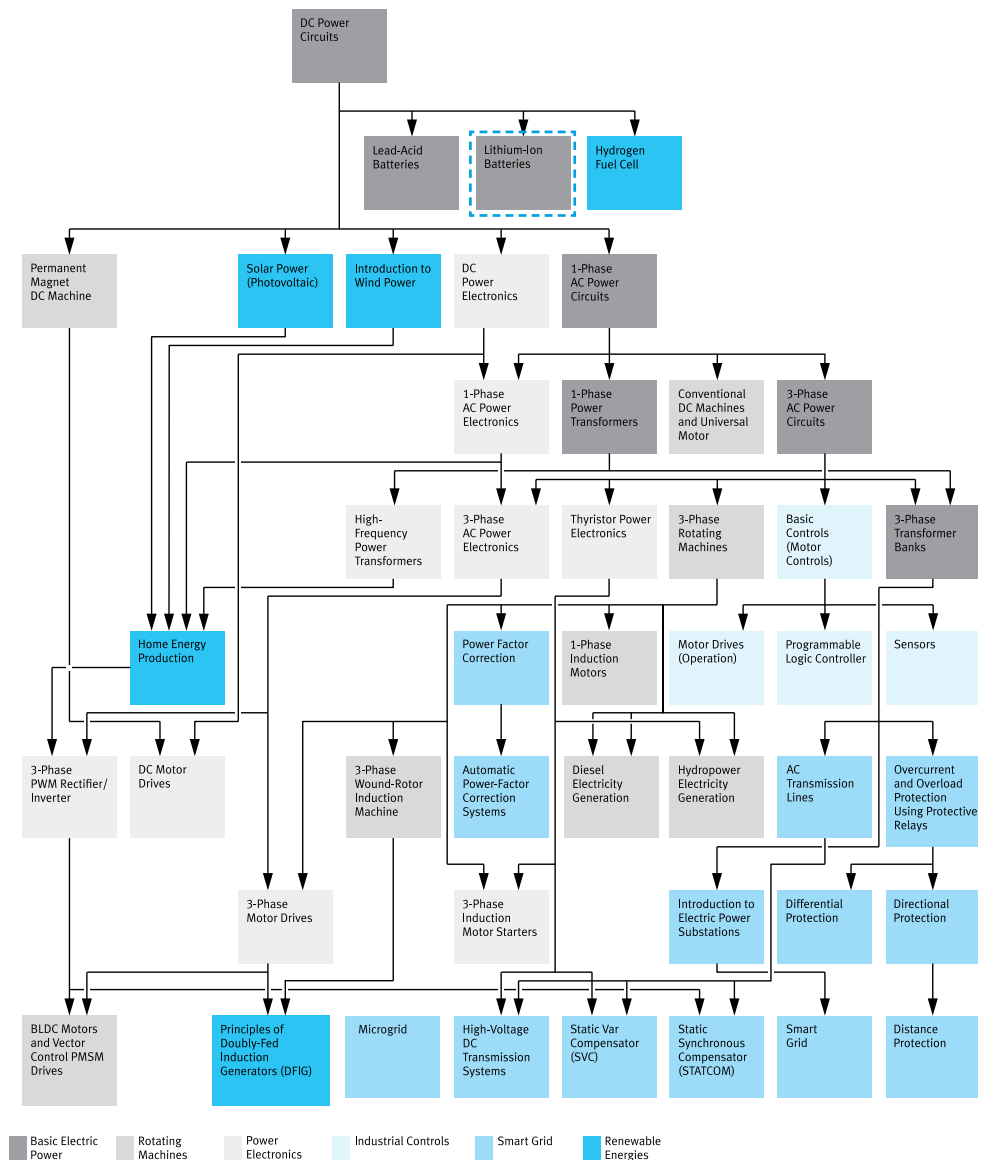
The software tools

The free LVDAC-EMS software provides a user interface for measuring battery parameters, recording data, and adjusting the Li-ion battery pack settings. This functionality is enabled through the four-quadrant dynamometer, which is used for battery charging and discharging.

Expansion opportunities

The modules of the 8010-N can be combined with additional equipment of the LabVolt Series 8010 to study additional topics in the Electric Power Technology course program. This makes the 8010-N a flexible and cost-effective investment.

The Electric Power Technology Course Program, at a glance:



Do you have questions or need a quote?

Whether starting with the LabVolt Series 8010 or expanding your current setup, contact your Festo Didactic sales representative for personalized advice.

Order numbers

8010-N (EN, 120 V, 60 Hz): 8243597
 8010-N (ES, 120 V, 60 Hz): 8243598
 8010-N (EN, 220 V, 50 Hz): 8243599
 8010-N (EN, 240 V, 50 Hz): 8243600
 Campus license (EN): 8243459