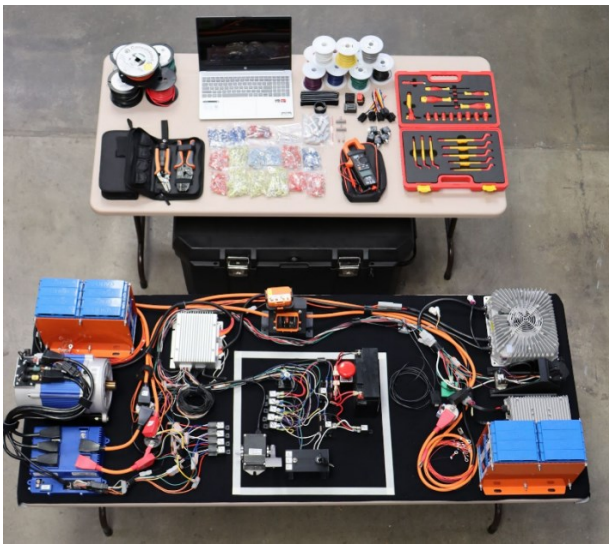
ELECTRIC SYSTEMS LAB



A HANDS-ON GROUP PROJECT FOR TEACHING COMPLEX ELECTRICAL SYSTEMS

Build a full-scale functional electrical system in your classroom with the Electric Systems Lab. This educational tabletop project uses open source industry components to give students a safe and engaging way to explore the fundamentals of real-world electrical systems. Students gain practical experience in complex system design, layout and execution through wire diagram reading and creation, customizable component layout, fabrication and connection of wiring systems, programming the battery management system, and finalizing the project with CAN controlled battery charging and electronic motor control…all at safe ASE voltage levels to maximize learning potential while minimizing safety concerns. The Electric Systems Lab is a versatile learning platform for anyone interested in electrical engineering, systems design, electric vehicles, renewable energy, cell configuration, and more!

EDUCATIONAL BENEFITS:

- Designed for 4 - 6 students
- Learn the purpose & functions of complex wiring schematics
- Understand component uses, relationships, and interactions
- Teach fundamentals of batteries & electric motors
- Test students' knowledge through troubleshooting challenges
- Practice proper wiring techniques
- Intro to high voltage safety
- Reusable & rebuildable project

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Teaching Points:

- How to read wire schematics
- How to cut, terminate, and connect wires
- How to measure volts, amps, and resistance
- Set basic controller parameters
- Set basic BMS parameters
- How to identify components in an electric drive system
- Understand the relationship between components in a system
- How to lay out components to create a working system
- Familiarity with CAN networks
- How relays work
- Why and where to use relays and solenoids
- Balance battery cells
- Safely connect and disconnect high voltage cables
- Measure and monitor high voltage battery pack
- How to troubleshoot high and low voltage wiring systems

Included Components:

- 5.5kw Induction Motor with Controller
- Lithium Iron Phosphate Cells
- Battery Management System
- CAN Controlled Lithium Battery Charger
- DC to DC Converter and Auxiliary 12v Battery
- Manual Service Disconnect (MSD)
- Relays, Solenoids, low-voltage switches
- Wire Fabrication & Connection Supplies
- Programming Laptop and Cell Wiring Validator
- Insulated Tool Set
- Instruction manual and Wiring Diagram and Layout
- Two Folding Tables for Project Assembly and Workspace
- Rolling Storage Container

Technical Information:

- Build Table Dimensions - 72" x 30"
- Project Table Dimensions - 72" x 30"
- Crated Weight - 250lbs
- Maximum Pack Voltage – 57.6 VDC
- Nominal Operating Pack Voltage – 51.1 VDC
- Lock Out Tag Out Maximum Voltage – 28.8 VDC
- Low Voltage System Operating Voltage – 12 VDC
- Charging Input Voltage – 120 VAC to 240 VAC