



# Electric and Hybrid Vehicles

Worldskills proud supporter

## **OFFERING YOU INTUITIVE SOLUTIONS**

For more than 50 years, ConsuLab has devoted our business plan to offering intuitive solutions to educators. This is more than just a catch phrase or a marketing line; this is at the core of ConsuLab's beliefs. Since our beginnings in 1969, ConsuLab has specialized in manufacturing and distributing high-quality training equipment to help you teach ever-evolving technology.

Over this time, we have developed a reputation for quality and innovation in the fields of transportation technology, truck and heavy equipment and many programs dealing with electricity, electronics, hydraulics and pneumatics. We do not build simulators, we build training equipment that can be used for years. All of our educational training aids are built to better utilize instructors' time, to help students meet the requirements for their specific program and to prepare them to become a productive and successful part of the workforce.

We are devoted to the technical education industry. We employ former educators, we design and build training aids with educators in mind, and we take the concept of helping you teach technology very seriously by offering intuitive solutions through highly engineered and well-crafted training aids.

We partner with many organizations in the industry because we are passionate about developing the highest quality truck and heavy equipment technicians and assisting you in helping shape the future of the trades.

We thank you for this opportunity and encourage you to take time to look through this catalog to find intuitive solutions to today's transportation technology.



**Kevin Boden, President**

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## **EV-601-TS\_053322** **Interactive Demonstrative Electric Vehicle**

**The EV-601 is a cutting-edge educational tool that brings the world of electric vehicles into the classroom.**

Designed specifically for training purposes, this advanced vehicle offers a range of benefits to students, teachers, and educational institutions, through its interactive screens and full component layout. The EV-601 is a real-world Electric Vehicle (EV TESLA Model 3) that still retains all its functional systems and it's high voltage system has been replaced with Consulabs simulated safe High Voltage system.

The EV-601 provides a unique opportunity for students to engage in hands-on learning experiences through the Consulab interactive display and the protected high voltage test points throughout the vehicle. The biggest advantage of the EV-601, is it will have students learning the inner workings of an electric vehicle, drive systems, charging, thermal systems, battery systems without the risk associated with high voltage.

- HV Components: Inverter, contactors, DCDC, AC HV compressor, motor, HV cables, charger, PTC heater
- Thermal battery system components
- HV battery test points testing. (battery, steering, HVAC, Motor systems)
- Functional TESLA™ Service Mode
- Plug in charger.
- Battery management system
- HV cable layout
- Interlock function
- Isolation function
- ADAS system cameras and components
- First responder's functional loop

Teach real EV training with an EV vehicle in a safe and controlled vehicle

Minimal set up – Move EV-601 into a shop or lab and turn on power and set park brake.



## EV-360\_053325 ADAS (Advanced Driver Assist Systems) Trainer

Become part of an automobiles Advanced Driver Assistance System by viewing the information that all the ADAS sensors see !

- This trainer allows a student to visualize an assortment of actual sensor readings used in an ADAS assisted vehicle
- Comparing the strengths and weaknesses of the various sensors and technologies to one another
- Sensor Fusion is experienced by the student



## CL-1930\_053283 Connector Trainer - circuit and signal acquisition

A robust, reliable way to teach back-probing and oscilloscope use !

The Connector Trainer is not just a training aid; it's a purpose-built system designed for mastering the art of back-probing connectors, promoting intricate oscilloscope readings, and honing advanced diagnostic skills. It is the opposite of a breakout box; it provides the ideal learning environment for students to practice real-world back-probing techniques.

- Diverse signal exploration, from digital square waves to sine waves and variable voltage outputs.
- Practice oscilloscope use, using various time bases and voltage scales.
- 9 fault scenarios, demonstrating frequency changes, voltage drops, and the effects on electronics.
- Field serviceable, easily provisioned, and replaceable terminals and connectors.



## EC-140H\_052944 Cutaway hybrid engine and drive train Prius

**A complete hybrid drive system in your classroom !**

Demonstrates the following driving modes :

- Reverse.
- Engine start.
- Low speed and low acceleration (stealth).
- Normal drive (cruise).
- High speed and full-throttle acceleration.
- High speed energy recirculation.
- Coasting.
- Regenerative braking.
- Observe the CVT function of the power split device.



## EM-200-29\_053137 Hybrid planetary gear set trainer

**Demonstrates power flow in a hybrid drivetrain.**

- Students can direct power flow to determine the operation and interaction of different drive line components.
- Focuses on the planetary gear set system, or "Power-Split device".
- Operation manual with illustrated hybrid modes.



# High-Voltage Safety



## EV-400\_053287 EV High-Voltage Safety Trainer

**Measure 400V DC in a completely safe, controlled, classroom environment.**

**Teach High-Voltage Safety** in a compact classroom sized package through an intuitive, hands-on experiences for high-voltage testing, Personal Protective Equipment (PPE) use including gloves and insulated tools, **high voltage isolation testing** with a mega-ohmmeter, **high voltage interlock circuits**, first responders' loops, three phase motor control, high voltage power distribution, and much more.

The product has a **fault box** and a faulty component, allowing diagnostic practice. The system reacts as a real EV, demonstrating functions of various scenarios and components.

EV-400 transcends the limitations of traditional trainers. It's not just about demonstration; it's about active engagement, hands-on learning, and real-world application.

- Fault diagnosis 10 faults + 1 faulty component
  - High voltage loss of isolation
  - High voltage interlock loop
  - 12V supply problems
  - Air condition faults
  - PTC heater faults
  - Component faults
  - Harness faults
  - Contactor problems

This product is perfect for the following:

- Technical training programs: automotive, electrical engineering, emergency response.
- Educational institutions: motive power trades, vocational schools, community colleges, and high schools.
- EV manufacturers and repair shops: upskilling technicians and ensuring safety protocols.

The product includes student assignments, educational schematics and instructor schematics showing the faults.

Includes a PICO isolation meter and a set of large high voltage gloves.

**Available as a classroom set (12 units and storage case) (EV-400-12\_053355)**

**CL-1902\_053242**  
**Electromagnetism trainer**

**Equip your students for the electrified future.**  
**Apply theory hands-on.**

Do your students struggle with electricity? Do you have challenges capturing their attention and getting them interested in how electric motors work? Do you want to equip them with the skills and knowledge necessary to work on hybrid and electric vehicles?

The ConsuLab CL-1902 Electromagnetism trainer can help challenge your students and keep them engaged.

- Visualizes, teaches, and demystifies
- Coils
- Electromagnets
- Magnets
- Induction
- Right-hand rule
- AC generation
- Rectification
- DC motors
- Motor/generators
- Transformers
- Permanent magnets
- Solenoids
- This trainer will challenge your students and keep them engaged.
- Minimal setup time < 5 minutes.
- Easy to inventory
- Provided student exercises and experiments guide students through learning process
- Up to 50+ hours of instructional time

Available as a classroom set (12 units, storage case plus extra consumables.) (CL-1902-12\_053286)



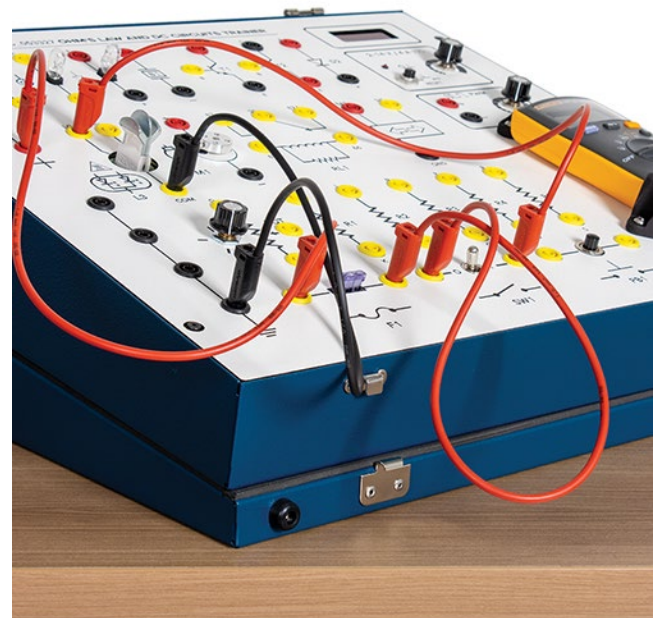
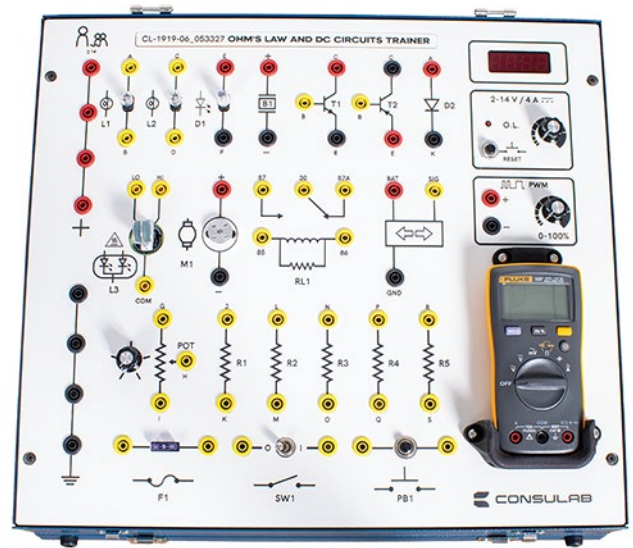
**CL-1919-06\_053327**  
**Ohm's law and DC circuits trainer**

**Best selling ConsuLab product ever! Student tested proven design.**

**In use at 500+ schools around the world**

- Built-in adjustable protected power supply.
- All components protected against incorrect wiring & short circuits!
- 1000s of students have learned ohm's law using this trainer !
- Industry leading curriculum package.
- Complete course on Ohm's law, series parallel and more.
- 266 pages of content.
- 31 student exercises.
- 11 student tests.
- Proven robust hardware.
- All components fixed to trainer.
- Easily sourced consumables (#194, 3157 etc.)
- Built-in multimeter
- Saves teacher's time.
- Consistency across multiple units, easy setup, pre-written labs.
- Exquisite top-quality gold-plated jumper leads minimize voltage drops.
- Full answer keys for all exercises and tests.

Available as a classroom set (12 units, storage case plus extra consumables.)(CL-1919-12\_053205)



Explore hands-on learning with ConsuLab classroom kits. Each kit comprises 12 trainers, a sturdy storage crate, and specific extra parts for fast repair and non-stop learning. Elevate your educational experience and prepare your student for the real-world challenges in automotive and technical fields.

### CL-1919-12\_053340 Classroom set of 12 Ohm's law trainers

- 12 CL-1919-06 Trainers
- 1 Storage Cabinet
- 10 extra Red Jumper Leads
- 10 extra Black Jumper Leads
- 12 extra Fuses (200 mA, 250 V)
- 12 extra #194 Light Bulbs (L1 & L2)
- 12 extra #3157 Light Bulbs (L3)
- 12 extra #2726 LED Bulbs (D1)



### CL-1902-12\_053286 Classroom set of 12 Electromagnetism trainers

- 12 CL-1902 Trainers
- 1 Storage Cabinet
- 3 magnetic field demonstrators
- 2 leads, black, 75 cm ea.
- 2 leads, red, 75 cm ea.
- 10 o-rings, 1/8" x 2.234" interior diameter, 1/8", 2.512" exterior diameter
- 2 aluminum rods
- 2 steel rods
- 2 rod magnets
- 3 plastic compasses



### CL-1930-12\_053336 Classroom set of CL-1930 connector trainers

- 12 CL-1930 Trainers
- 1 Storage Cabinet
- 4 Replacement pigtail connectors



## EC-2001-07\_053156 Cutaway hybrid scroll type A/C compressor

- 3-phase electric AC compressor cutaway.
- Driven by hand crank.
- Scroll compressor.



## Main Features of ConsuLab products

- Mobility
- Short set-up time
- Circuit components arranged in logical order
- Components and corresponding symbols are visible
- Occupies only a small area of the work bench
- Easily stored
- Additional components may be added to modules
- Designed with student safety in mind
- In tune with industry practices

## Limited warranty

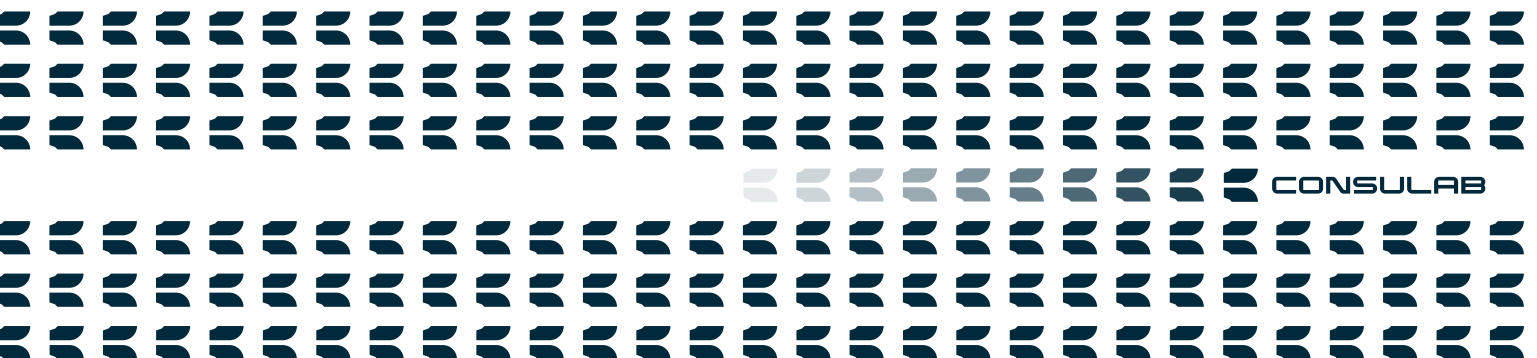
ConsuLab warrants that all systems which it manufactures are free from defects in workmanship and materials, provided that they are used under normal conditions and within the limits of the relevant specifications. This warranty is effective for one year from the date of delivery, and excludes any other warranty, whether oral or implied, such as (but not restricted to) any warranty as to fitness for a particular use.

ConsuLab will repair or replace at its sole discretion any part found to be defective during the period of the warranty. The liability of ConsuLab is limited to repairing or replacing parts in the system found to be defective and under no circumstances will ConsuLab assume responsibility for losses or other expenses which arise directly or indirectly from any malfunction of the system.

In no circumstances can ConsuLab be held liable for any personal injury or material loss or damage to any person or equipment, which is caused by any defect in the system other than as covered in this warranty. This warranty is not transferable. Any unauthorized modification in the system, or any falsification or removal of the serial number will immediately render this warranty null and void.

## Catalog Contents

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