



# 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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## Icon legend

	Electrical		Automobile vehicle platform
	Mechanical		Truck vehicle platform
	Pneumatic		
	Defective part		Recycled parts

## Documents provided

Operation manual	Student Assignments	Instructors Guide
PDF / Paper	PDF	PDF

### Operation manual:

Setup, Safety and Use

### Student Assignments:

Worksheets and any theory

### Instructors Guide:

Schematics, Faults, Tips and Tricks



## Interactive Demonstrative Electric Vehicle

EV-601-TS

**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.



Operation manual	Student Assignments	Instructors Guide
✓	40	✓

### ADAS (Advanced Driver Assist Systems) Trainer

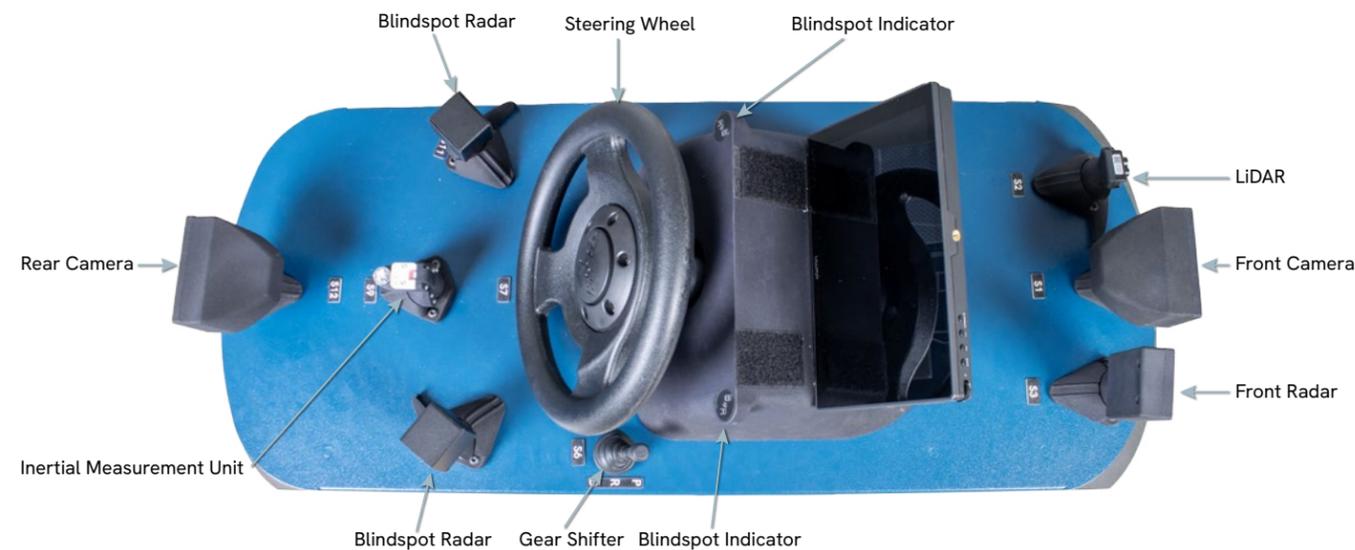
EV-360

Become part of an automobile's 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



Operation manual	Student Assignments	Instructors Guide
✓	16	✓



### Connector Trainer - circuit and signal acquisition

CL-1930

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.
- fault scenarios, demonstrating frequency changes, voltage drops, and the effects on electronics.
- Field serviceable, easily provisioned, and replaceable terminals and connectors.

Operation manual	Student Assignments	Instructors Guide
✓	21	✓

Faults 9



Classroom kit

### Hybrid planetary gear set trainer

EM-200-29

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.

**Operation manual**  
✓



### Cutaway hybrid engine and drive train Prius

EC-140H

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.



2010-2015 Toyota Prius

Operation manual	Student Assignments	Instructors Guide
✓	2	✓

### Electric Vehicle thermodynamic systems trainer

EV-2000

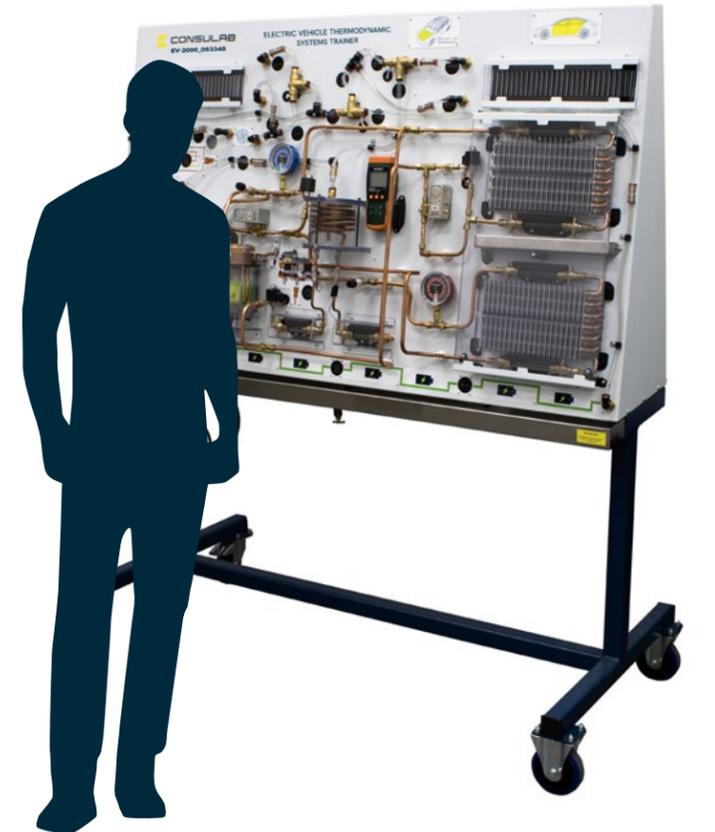
Teach the most complex part of EV thermal management by letting students see refrigerant paths, feel heat movement, and measure every exchange point.

This product is designed to teach the thermodynamic systems found in modern vehicles including electric, hydrogen powered, hybrid, and combustion platforms, covering powertrain, power electronics, battery, and cabin heating and cooling. It combines a refrigerant based heat pump, multiple heat exchangers such as condensers and evaporators, a multi-circuit glycol cooling system with dedicated pumps, a chiller, and electronically controlled valves and expansion valves to demonstrate real system behavior. Students can observe changes of state and track how energy moves through every part of the system.

The trainer includes a full suite of diagnostic scenarios that replicate real-world issues such as restricted airflow, iced evaporators, non-activating pumps, and malfunctioning expansion valves. Students can observe how each fault affects system pressures, temperatures, and flow behavior, allowing them to trace symptoms back to root causes. Each fault is paired with clear system reactions, giving learners hands-on experience in interpreting abnormal operation across both refrigerant and glycol circuits.

- Operational heat pump, chiller, heat exchangers, and electronic expansion valves
- Multi-circuit glycol cooling with dedicated pumps for battery, power electronics, and cabin
- Ten selectable operating modes
- Visualized refrigerant and glycol flow, temperature shifts, and state changes
- Integrated sensors for pressure, temperature, and energy measurement

Faults 7 6



- Simulated restricted-airflow scenarios across all heat exchangers
- Expansion valve, PTC heater, and glycol pump fault simulations
- Simulated evaporator or external heat-exchanger icing
- Observable system reactions in pressure, flow, and temperature for diagnostics

Operation manual	Student Assignments	Instructors Guide
✓	24	✓

### Cutaway hybrid scroll type A/C compressor

EC-2001-07

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

Operation manual ✓



### ConsuKit Student-Built Brushless DC Motor

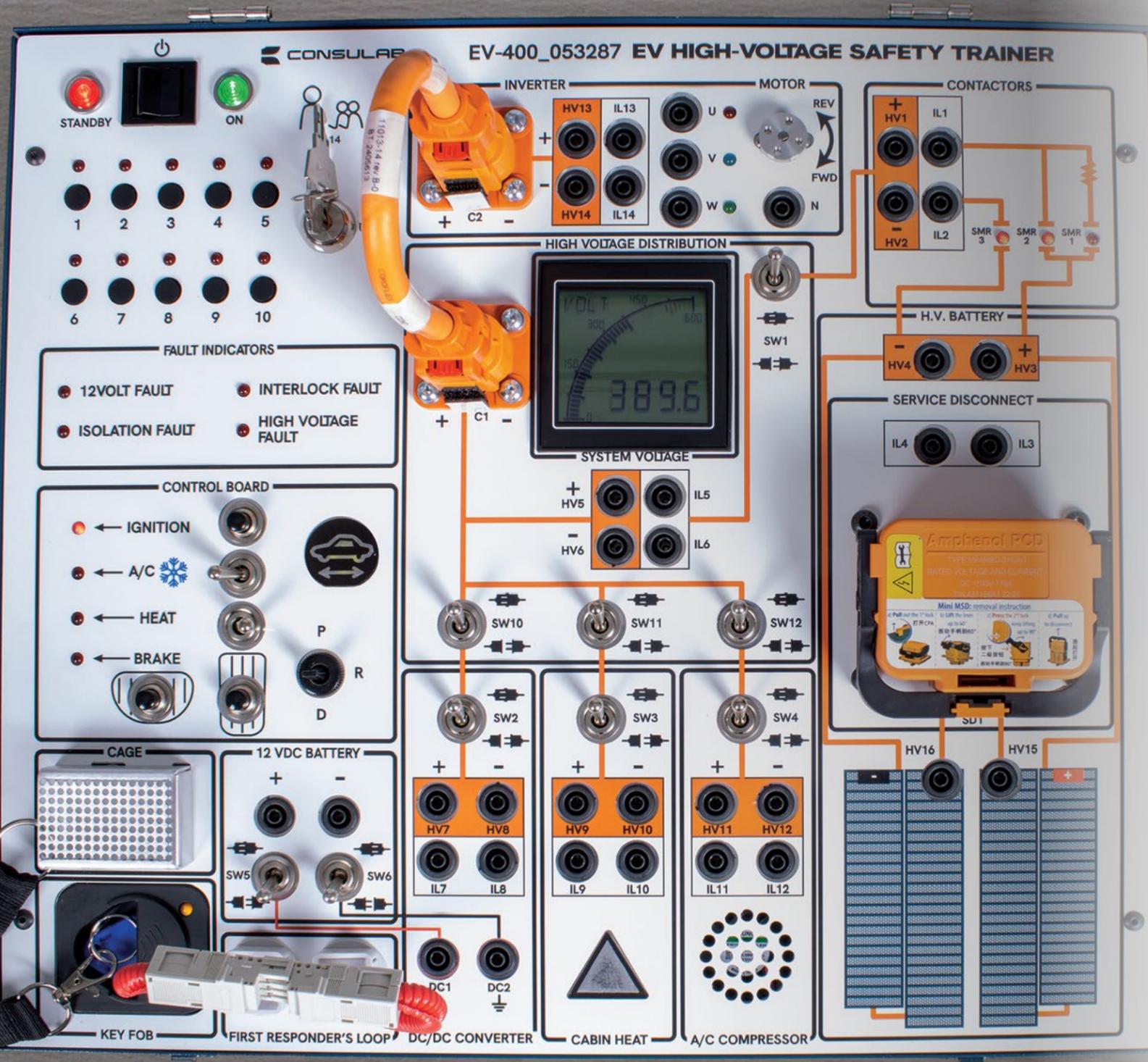
EV-100

Give your students hands-on experience by building a working 3-phase permanent magnet motor with the EV-100. Designed for middle school to college, this classroom-ready kit makes concepts in electricity, magnetism, and energy systems come alive—connecting directly to technologies in EVs, robotics, and STEM. Students learn by doing as they assemble, test, and prove their motor works.

- Complete 3-phase permanent magnet motor assembly kit. Everything you need is in each kit
- Students wind, connect, and arrange their own stator coils.
- Configurable as motor or generator for dual functionality. (M/G)
- Operates safely from 12V DC supply.
- Motors that are found increasingly in automotive (fuel pumps, EVs, fans, actuators)
- Testable with standard multimeters for resistance and AC output.
- Supports coil insulation and continuity checks with meggers.
- Allows oscilloscope analysis of 3-phase waveforms.
- Demonstrates magnetic field rotation and torque production.
- Provides measurable performance outcomes during operation.
- Enables efficiency testing in motor and generator modes from troubleshooting.
- Mirrors BLDC/EV motor operation principles in small and large applications.
- Designed for repeatable builds from one kit by students
- Comes with build guide, worksheets and troubleshoot guide for the instructor

Operation manual	Instructors Guide
✓	✓





## EV High-Voltage Safety Trainer

Faults 10 ⚡ 1 ⚙️

EV-400

**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.

- High voltage loss of isolation
- High voltage interlock loop
- 12V supply problems
- Air condition faults
- PTC heater faults
- Component faults
- Harness faults
- Contactor problems



Classroom kit

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.

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

Operation manual	Student Assignments	Instructors Guide
✓	21	✓



### Electromagnetism trainer

CL-1902

**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?

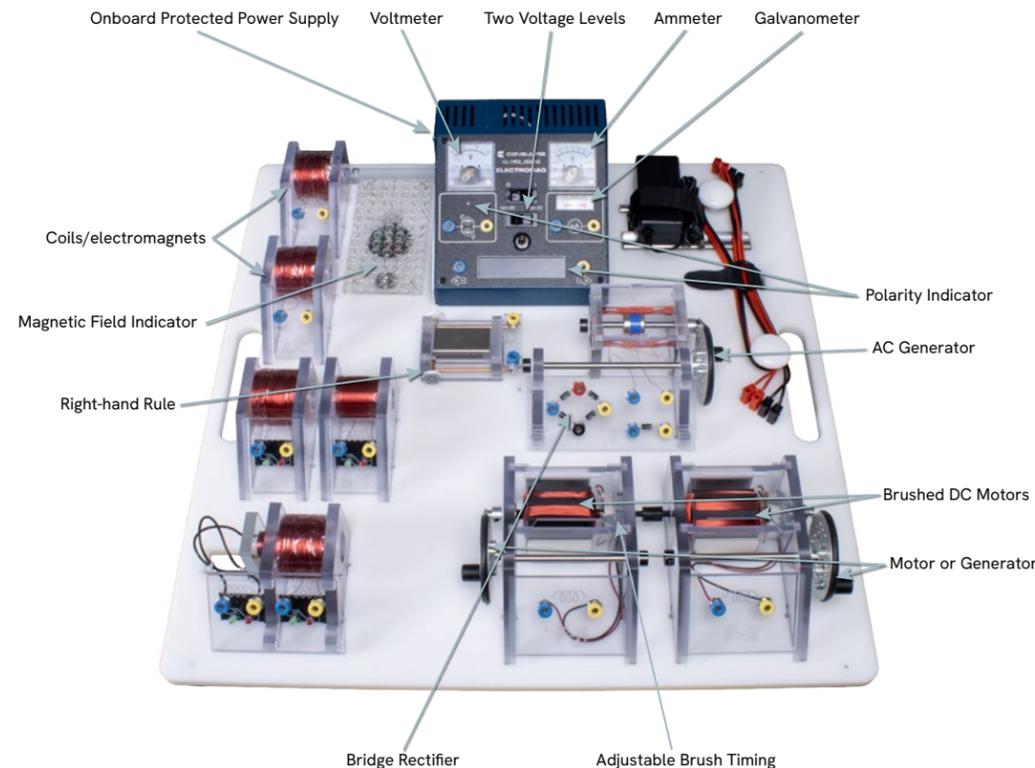
The ConsuLab CL-1902 Electromagnetism trainer can help challenge your students and keep them engaged.

- Minimal setup time < 5 minutes.
- Easy to inventory
- Up to 50+ hours of instructional time



Classroom kit

Operation manual	Student Assignments	Instructors Guide
✓	21	✓



### Ohm's law and DC circuits trainer

CL-1919-06

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

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

The CL-1919-06 Ohm's Law and DC Circuits Trainer has been certified by CSA Group a Nationally Recognized Test Laboratory, to meet the applicable standards for quality and safety in North America. This product is certified for use by persons 14 years and older only. This certification applies to both Canada and the U.S.

- 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 (350+ pages).
- Complete course on Ohm's law, series parallel and more.
- Proven robust hardware.
- All components fixed to trainer.
- Easily sourced consumables (#194, 3157 etc.)
- Built-in multimeter
- Consistency across multiple units, easy setup, pre-written labs.
- Exquisite top-quality gold-plated jumper leads minimize voltage drops.

Operation manual	Student Assignments	Instructors Guide
✓	33 + 14 tests	✓



Classroom kit



## 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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## Sales Team



**John Bukowski**  
Vice-President Sales & Customer Experience  
Ext. 6073  
1 770 823-5006  
[jbukowski@consulab.com](mailto:jbukowski@consulab.com)

1 810 222-4525 (USA)  
1 800 567-0791 (CAN)  
[sales@consulab.com](mailto:sales@consulab.com)



**Dave Gratton**  
Canadian Motive Power  
Accounts Manager  
Ext. 6069  
[dgratton@consulab.com](mailto:dgratton@consulab.com)



**Jean-Martin Savard-Demers**  
Sales Representative  
Ext. 6025  
[jmsavarddemers@consulab.com](mailto:jmsavarddemers@consulab.com)



**Jimmy Dinsmore**  
US Sales Support & Sales Representative  
Ext. 6053  
[jdinsmore@consulab.com](mailto:jdinsmore@consulab.com)



**Buster Ford**  
Sales Representative  
Ext. 6089  
[bford@consulab.com](mailto:bford@consulab.com)



**Russ Ferguson**  
Sales Representative  
Ext. 6075  
[rferguson@consulab.com](mailto:rferguson@consulab.com)



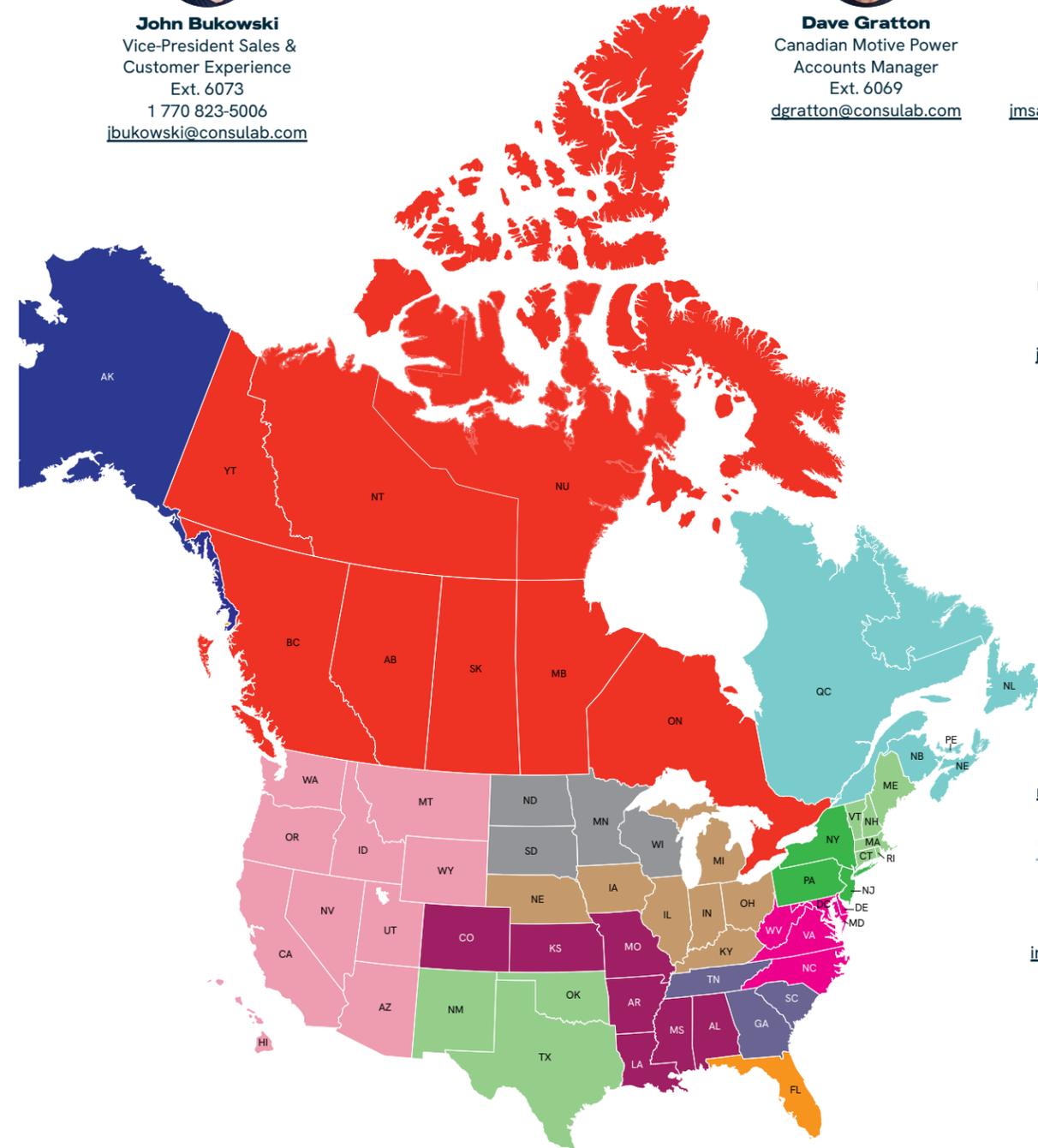
**AllegHENY**  
1 800 232-7600  
[info@alleghenvedusys.com](mailto:info@alleghenvedusys.com)



**Ed Clayson**  
Daktic President  
1 801 310-1524  
[eclayson@daktic.com](mailto:eclayson@daktic.com)  
[www.daktic.com](http://www.daktic.com)



**Mark Jones**  
Georgia Educational Solutions  
1 678 488-4954  
[mark@gaedolutions.com](mailto:mark@gaedolutions.com)



**Mike McGhee**  
Cutaway Creations LLC  
1 304-724-1188 (office)  
1 703 217-7274 (cell)  
[info@cutawaycreations.com](mailto:info@cutawaycreations.com)



**Toolkit Technologies**  
Sales Representative  
1 512 203-0590  
[info@toolkittech.com](mailto:info@toolkittech.com)  
<https://toolkittech.com/>



**First Technologies Inc.**  
1 800 787-9717  
[info@firstteched.com](mailto:info@firstteched.com)

## Education Team



**Nathan Banke**  
Director of Education  
Ext. 6039  
[nbanke@consulab.com](mailto:nbanke@consulab.com)



**Jérôme Bergeron-Carpentier**  
Educational Specialist  
Ext. 6093  
[jbergeron@consulab.com](mailto:jbergeron@consulab.com)



**Rick Martineau**  
Educational Specialist  
Ext. 6063  
[rmartineau@consulab.com](mailto:rmartineau@consulab.com)



**Richard Krieger**  
Educational Specialist  
Ext. 6052  
[dkrieger@consulab.com](mailto:dkrieger@consulab.com)



**David Giles**  
EV Educational Specialist  
Ext. 6091  
[dgiles@consulab.com](mailto:dgiles@consulab.com)



**Anthony Langlois-Sarasin**  
Educational Specialist  
Ext. 6055  
[alsarasin@consulab.com](mailto:alsarasin@consulab.com)



**Al Santini**  
Educational Specialist  
Ext. 6056  
[asantini@consulab.com](mailto:asantini@consulab.com)

