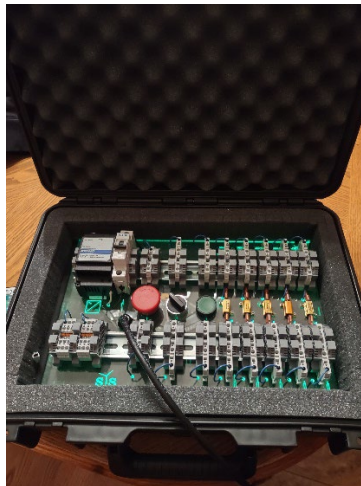


Basic Electrical Training System

Description and Use Instructions

The Basic Electrical Training System is used to complement basic electrical theory training by allowing the student to gain hands-on experience creating basic series, parallel, and combination circuits to reinforce Ohms Law concepts. Circuits are created using wire to create circuits by connecting different resistance values into a known voltage source and then using a Digital Multimeter to measure voltage and current values within the circuit.



The components used within the training system are the same components used within modern automation control systems in power generation, motion control, and manufacturing. By using the actual components in the training systems, students will immediately relate to the same components when they enter the workforce.

The resistors used in the training system are very precise which removes the distraction caused by different calculated value from the actual measurements. Using spring terminals familiarizes the student with how to open them and insert wires without damaging the terminals. The terminals allow for a positive connection which reduced the likelihood of a loose wire connection causing an error in the circuit.

The system is designed to be touch safe by eliminating the possibility of a student contacting voltages over 12 VDC during training. This can allow for use of the system without electrical insulating gloves, if company policy allows. The system is powered from a normal 120VAC, 15amp wall outlet and is circuit breaker protected to protect building circuits from damage created by an improperly wired circuit in the training system.

Electrical symbols are backlit with LEDs to make it easier for the student to relate schematic symbols with the components and encourage schematic reading proficiency. The symbols follow the IEC standard for electrical component symbols. The color and brightness of the LED system can be changed with the remote control. The LEDs will power back up in the last configuration they were in when the unit was turned off and unplugged.



Read all instructions and view the video that came with the unit before using the unit in instruction of students. Failure to follow this advice could result in injury or damage to the unit.

Directions for Use:

This system should be used as part of the Ohms Law presentation of Basic Electrical courses. The instructor is encouraged to draw a basic series circuit on the board with one power source (12VDC) and one resistor (choose a value of one of the resistors in the training unit). Calculate the voltage drop across the resistor and the amount of current flow on the board using the $E=IxR$ relationship.

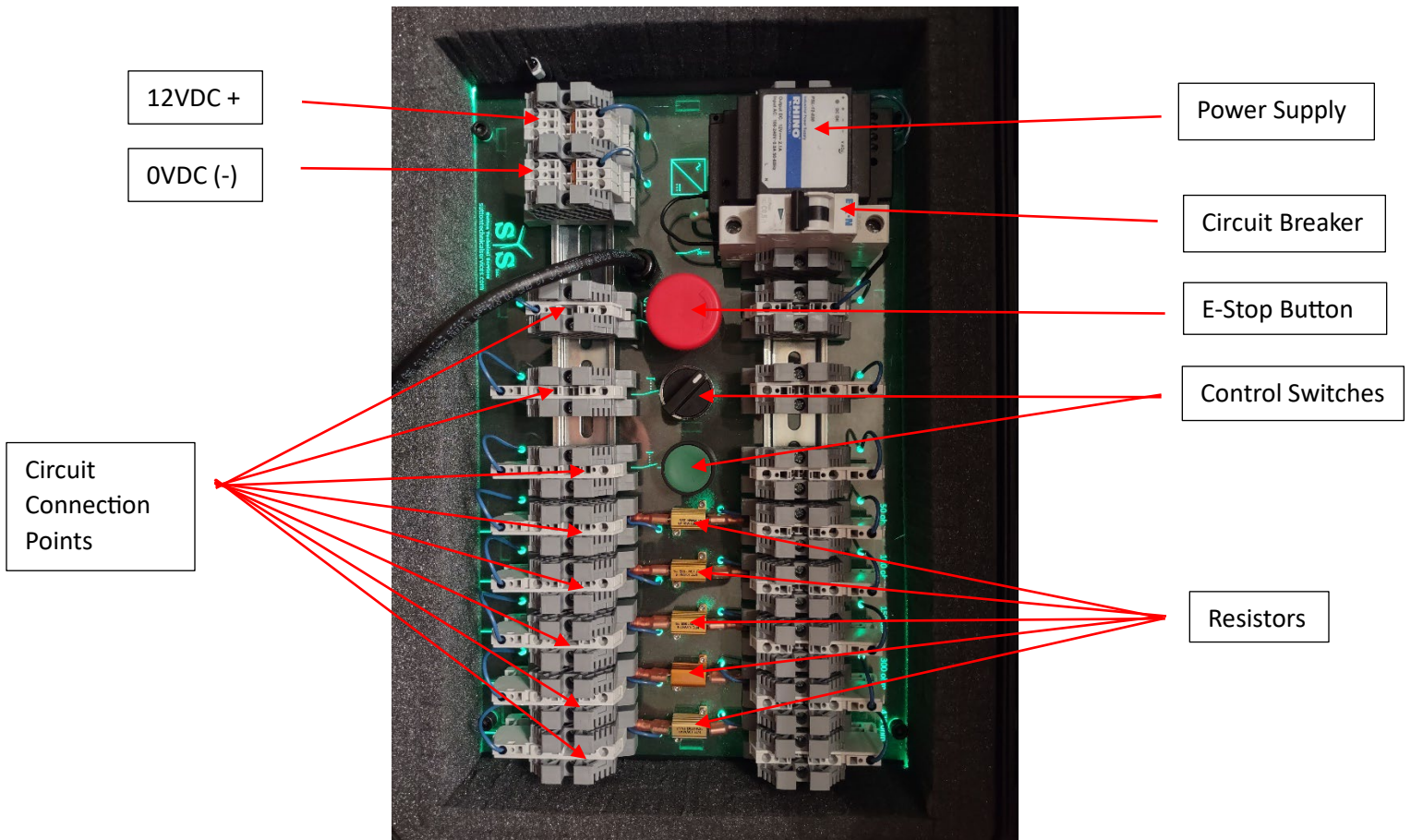
Premade wires are included in the kit and are to be used with a 2.5mm straight blade screwdriver to open the spring terminals and insert the wire end. **AT NO TIME** should the screws on the circuit breaker or power supply be accessed by a student at any time with a screwdriver. Voltage levels at these locations can be over 50 volts and require additional precautions.



Instruct and guide the student using their meter to measure the voltage drop and current in the circuit and show that the calculated value is the same as what is measured. Repeat this process as many times as needed until the students gain a good understanding of the relationships. Add another resistor in series and demonstrate the relationship with an increase in resistance and current flow and voltage drops.



Monitor the students to ensure that the meter leads are not left in the amperage measurement configuration when attempting to measure voltage. Damage to the meter or training unit will result if the meter is not configured properly.



Continue to use the system to create parallel circuits and measure voltage and current. Combination circuits should also be created and solved on the board as well as measured with the meter.

The training system can also be used to teach fundamentals of troubleshooting by placing an open circuit somewhere within the circuit and having the student use voltage drop measurements to isolate the location of the fault.

A diode and a rectifier are included in the kit to allow the student to use the meter to determine how a good diode or rectifier is tested. These ARE NOT to be installed as part of a circuit and should only be used separately to demonstrate how to measure them with a meter.

Packaging for Transport:

Remove the wires installed by the student and place back in the plastic bags. Unplug the unit and roll the cord around the interior of the case as shown in the photo. Place the remote and bags of wires and accessories in the middle of the board and close the lid while making certain nothing is pinched in the lid.

