



Southern California Regional Transit Training Consortium

COURSE NAME: [Digital Volt Ohm Meters for ITS Diagnosis and Repair in Transit](#)

Course Item Number: [#SC-DV-2700-I](#)

Prerequisites: Personal experience with Volt Ohm Meter Desired

Course Description: The class is designed to improve technicians' understanding of basic DVOM functions. Students will be working with a Digital Volt Ohm Meter (DVOM) to learn its safe usage. Students are encouraged to bring their own meters for comparison. Course includes both lecture and lab experiences.

Course Benefits: The benefit of this course is designed to expose the students to all the capabilities of the DVOM. Students will gain knowledge about the functions of the various DVOM screens using their own meters as an example. Fluke meters are emphasized as a base, with other meters including specialty meters such as the fluke 1587 which is capable of safely testing the High Voltages in the Electric and Hybrid Vehicle System.

What one will learn:

- Use of the functions of the DVOM
- Proper hookup of the DVOM for each function
- Interpreting basic DVOM digital displays
- Voltage measurements
- Resistance measurements
- Amperage measurements
- Frequency measurements
- Min/Max, diode and other special functions
- Identifying open and short circuits

Course Times: 7:00am - 3:30pm each day. (SUBJECT TO CHANGE – CHECK REGISTRATION)

Number of Hours/Days: 16 Hours over 2-Days

Continuing Education Units (CEU): 0

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www.scrttc.com



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Equipment Requirements

- Classroom with computer/projector
- PowerPoint presentation
- Student workbook for each technician
- Master included with instructor's set includes PowerPoint and lab exercises
- Fluke meters are emphasized as a base, with other meters including specialty meters such as the fluke 1587 which is capable of safely testing the High Voltages in the Hybrid Vehicle System.
 - one for every two techs minimum with techs encouraged to bring their own.
- Demonstration pieces for each DVOM mode
 - ie: resistors, TPS, knock sensors or frequency modulator, AC & DC voltage sources rectifier bridge/diodes. Jumper wires and simple circuits to practice voltage drop, amperage and short/open circuit examples—can use vehicle if available



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Multi-meter Course Outline

- 1) Introductions
 - a) Instructor
 - b) Technicians
 - c) SCRTTC

- 2) Intelligent Transportation Systems
 - a) Introduction to ITS
 - b) ITS uses
 - c) Typical ITS systems
 - d) ITS reliability
 - e) DMM diagnostics

- 3) Integration of Intelligent Transportation Systems
 - a) Communication Systems
 - b) Data systems
 - c) Vehicle operating systems
 - d) Maintenance management systems

- 4) History
 - a) Federal legislation

- 5) Implementation of Intelligent Transportation Systems
 - a) Transit agencies
 - b) Other transportation agencies
 - c) Typical Intelligent Transportation Systems
 - d) Communication systems
 - e) Data systems
 - f) Vehicle operating systems
 - g) Maintenance management systems

- 6) Smart Bus
 - a) Integrated multi-function computer and communication systems
 - b) Computer aided dispatch
 - c) CAD/AVL system
 - d) Computerized vehicle performance data
 - e) Enhanced traffic signal maintenance priority
 - f) Other

- 7) Multi-Meter Functions in General
 - a) Specific Meter Functions
 - i) Auto Ranging
 - ii) Test leads
 - iii) Analog bar graph
 - iv) Touch hold
 - v) Frequency function
 - vi) Duty cycle function
 - vii) Min/max function
 - viii) Diode test function
 - ix) Voltage
 - x) Voltage drop
 - xi) Ohms test function
 - xii) Amperage test function
 - xiii) Open circuits
 - xiv) Short circuit
 - xv) Temperature testing