

# Effective use of Measuring Equipment

## Course Aims

To provide delegates with the necessary knowledge and skills to identify the structure and outline the characteristics of simple direct current electrical circuits

Understanding and explaining the conditions that can alter the way in which direct current (DC) circuits function

To enable the delegate to accurately measure electrical values in automotive electrical circuits

## Duration

6 Evening Sessions  
(2 to 3 hours per session) or  
two consecutive days

## Course Contents / Criteria

- **Electrical theory**

Theory of electricity

Static and dynamic electricity

Electrical current

Voltage and electromotive force

Resistance

Electrical power

Resistor colour coding

- **Electrical Circuits**

The electric circuit

Simple, series, parallel & series / parallel

Electrical symbols

Measuring voltage current and resistance

Ohms Law

Electrical power & work

On completion of the course the delegate should be able to:

- Outline how electrical fundamentals are applied to simple direct current electrical circuits
- Use of a multimeter to measure electrical values in simple electrical circuits and components
- Explain the relationship between voltage, electrical current flow, resistance and power in direct current (DC) electrical circuits
- Identify closed and open circuits and outline their voltage & electrical current flow characteristics
- Identify series and parallel circuits and outline their voltage and electrical current flow characteristics
- Identify short, ground and open circuits and outline their effects on series and parallel circuits

### Pre-requisites

- An understanding of electricity, magnetism and electromagnetism
- A basic understanding of electricity
- No specific qualifications required
- Advance payment required at least 7 days before commencement of the course
- Access to a computer and the internet for the after course “refresher” training

### The CLEMS Management System

The course can be delivered in stand alone mode or delegates tracked using the CLEMS (Computerised Learning and Evaluation Management System). CLEMS allows the instructor to monitor individual student and class activities and then automatically record each individual's progress. CLEMS uses the standard Internet Explorer interface & can be accessed locally or via the Internet.

## Course Theory & Practical Work

### Construct simple electrical circuits

#### Measurement of

Voltage  
Current  
Resistance

#### Experiments to

Prove Ohm's law by experimental procedure

Determine the value of resistors from measured values of current and voltage

Determine the power in a resistor from measured values of current and voltage

Measure series connected resistors

Measure the voltage drop across series connected circuits

Demonstrate Kirchoff's Voltage Law in series circuits

### Fault Diagnosis, locating the following faults

Open circuits  
Short circuits  
High resistance circuits

