# Course - Automotive 2: Electronics and digital technology in vehicles

Includes:

- 1 Experiment card with diode circuits (Si, Ge and Zener diodes)

- 1 Experiment card with transistors for building various circuit configurations (common emitter, common collector, with or without feedback)

- 1 Experiment card with logic gates (NOT, AND, OR, NAND, NOR, EXOR, EXNOR) and a sequence of gates

- 1 Experiment card with JK flip-flop

- CD-ROM with Labsoft browser and course software

Course contents:

- Introduction to common designs ad properties of diodes

- Identifying typical diode applications

- Determining the valve and rectifier actions of diodes

- Recording static and dynamic characteristics for various diodes

- Determining diode parameters by measurement

- Investigation of limiting circuits using Zener diodes (with and without load)

- Introduction to basic transistor circuits

- Design and investigation of a transistor switch

- Experiment to set the operating point of a transistor

- Measurement of gain and input/output resistances in common emitter and common collector circuits

- Investigating the effect of resistive and capacitive feedback in a common emitter circuit

- Introduction to basic logic circuits

- Introduction to truth tables and symbols, logic equations and timing diagrams for each of the basic gates

- Experimental derivation of Boolean functions and laws

- Design of basic logic circuits using NAND gates and NOR-gates

- Minimisation of logic circuits with the aid of Karnaugh maps with experimental testing
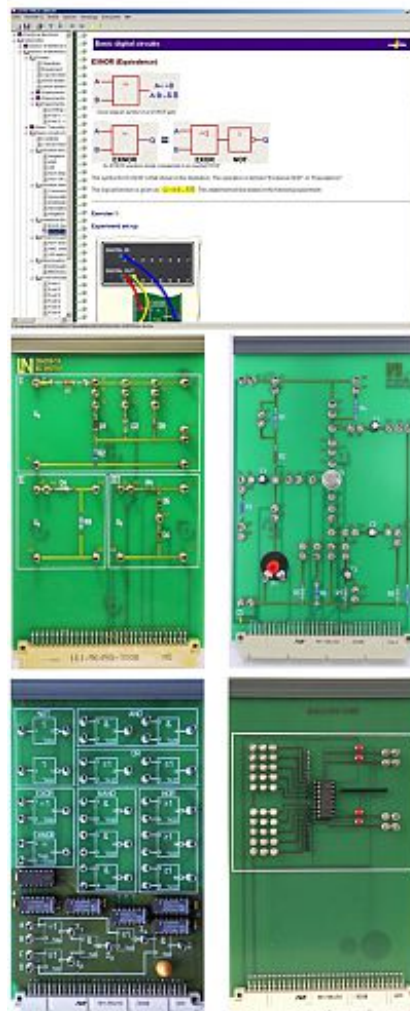
- Introduction to the principle of a flip-flop

- Investigating the operation of a JK flip flop by measurement (static and dynamic input signal/single-pulse operation)

- Investigation of a counter circuit

- Fault simulation (16 simulated faults activated by relay)

- Course duration 9.5 h approx. (fault finding 2.5 h approx.)