



### Important attributes:

- An interactive user interface for knowledge of electronics fundamentals in automotive technology
- Mapping of real measurements on virtual instruments
- Suitable for self-elaboration of knowledge content by the students
- Worksheets for learning control
- System requirements:  
Windows XP SP2, Vista or Windows 7  
CD-ROM drive for program installation  
Optimal screen resolution:  
1024 x 768 px (resolution independent)

### Program description:

The program explains the basics of automotive electronics, using text, images and animations, as well as showing measured values on virtual instruments such as voltmeters, chart recorder, oscilloscope, etc.. Worksheets for learning control can be printed.

The **course module automotive electrical / electronics** consists of three coordinated individual modules:

- **Electronics 1 Basics:** Explanation of specific components in automotive technology and associated circuits
- **Electronics 2 sensors:** Explanation of the technical structure and presentation of the metrological Signals as a function of the monitored non-electrical size.
- **Electronic 3 actuators:** Explanation of the control characteristics of the clocked control of typical actuators.

You get an explanation of the various parts of the program on the following brochure pages.

### Note:

The course module offers an affordable entry into the teaching of the basics of automotive electronics **without** the hardware-based connection to the **AndiLAB** Docking station and the respective **AndiLAB** course module plates.

A later extension to the **AndiLAB** hardware for hands-on experiment is possible at any time. The price of brewed software will be deducted from the purchase. The educational software is then converted from the simulation mode for real data acquisition.

With **AndiLAB** you get a extensive and efficient learning system for school and training.

### Order-number:

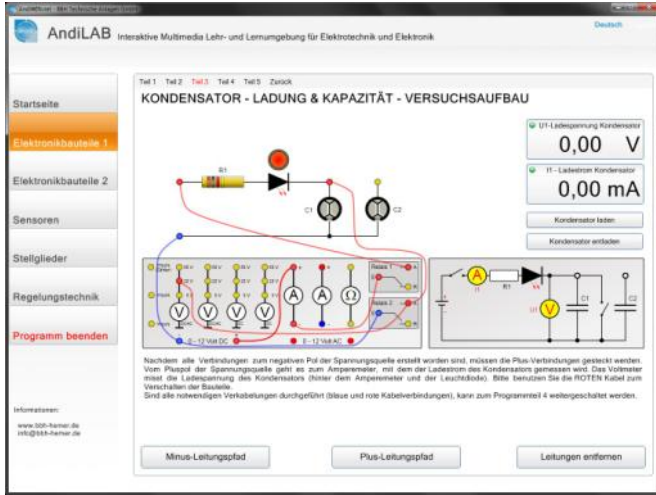
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Elektronics 1 Basics / Circuit design:

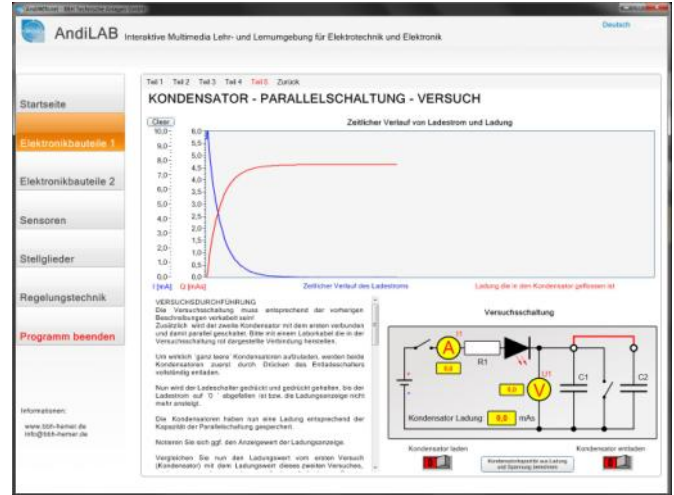
The first part Electronics basics consists of 12 attempts for development of the structural properties of resistors, PTC, NTC, capacitors, inductors, diodes, transistors and thyristors.

In the second part circuit design you learn more about analogous circuits for automotive technology electronic components, such as functional constructed flasher (multivibrator), pump relay, automatic pre-heat relay, analysis speed sensor, tachometer, overvoltage protection by using the components from the first part of the course.

Screenshots from the program Electronics 1 with the topics of electronics basics and circuit design:



Screenshot shows the diagram for wiring the experimental setup capacitor



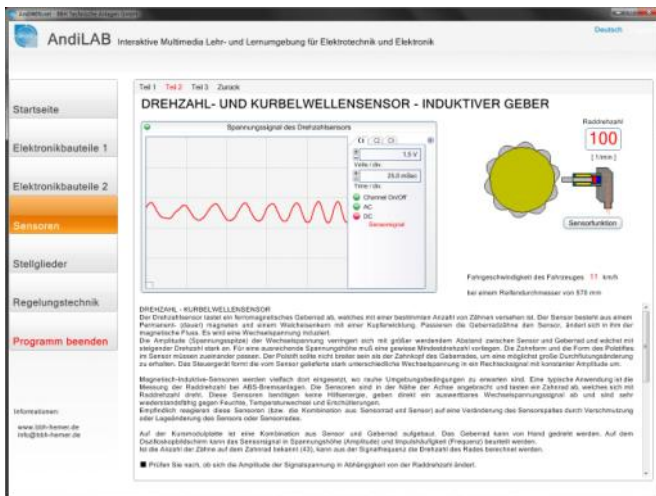
Screenshot shows the measured values of experimental setup for the capacitor

Elektronics 2 sensors in automotive technology:

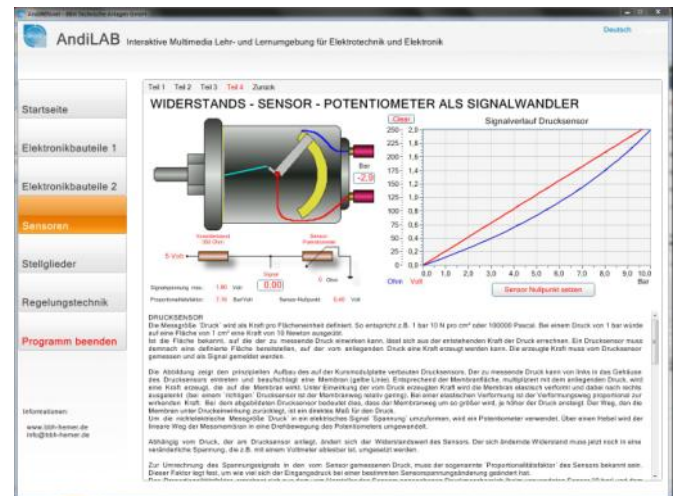
The course module, Electronic 2 sensors explains the technical design and provides real measurement values of the signals as a function of the monitored non-electrical size.

This course module covers resistance-based sensors such as throttle position, NTC temperature sensor and pressure sensor, air flow meter and hot-wire air mass sensor, magneto-inductive wheel speed sensor and an ignition distributor with integrated hall sensor.

Screenshots from the program Electronics 2 with the topics of sensors in automotive technology:



Screenshot shows the measured values on the subject of speed and crankshaft sensor



Screenshot shows the measured values on the subject of resistance-based sensors

Technical alterations are subject to change without notice!

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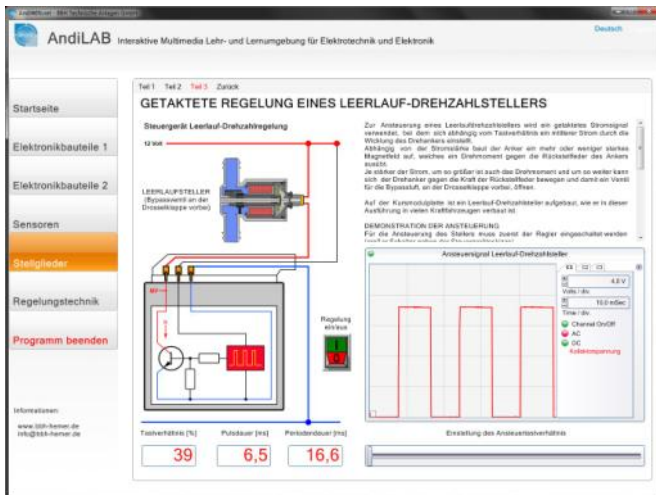
### Electronics 3 actuators:

The course module **Electronics 3 actuators** in automotive technology shows by using typical actuators like injection valve - idle plate - bulb the control characteristics of the clocked control.

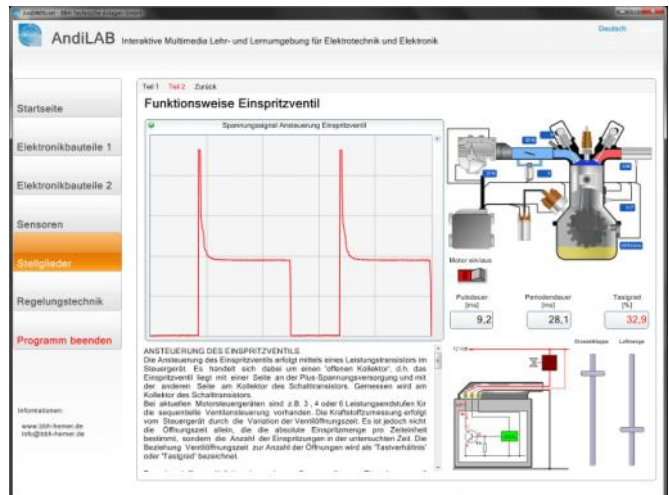
In experiments, the difference between a clocked and a linear control is shown.

This course module comprises an injection valve, which can be controlled with a variable duty cycle / closing time. Furthermore, the term 'duty cycle' will be explained and the comparison of linear and clocked control developed.

Screenshots from the program **Electronics 3 actuators** with the topics actuators in automotive technology:



Screenshot shows the measured values on the subject of Clocked control of an idle-speed control



Screenshot shows the measured values on the subject of injection valve operation