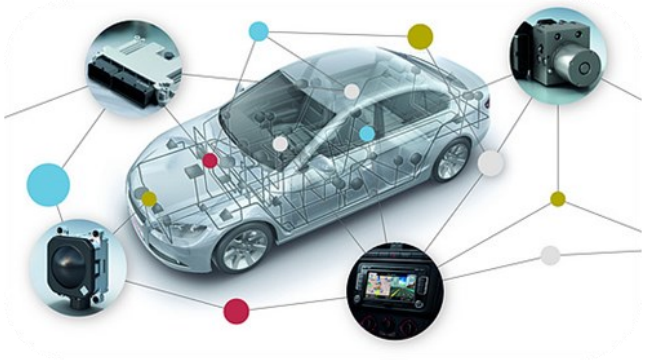
LHP 304
AUTOTRONICS



The LHP-304 laboratory covers all areas, theoretical and practical, concerning **all electrical systems included in various types of Automobiles**.

The LHP-304 laboratory is designed to provide students with **automotive training program** introducing various systems and components in modern cars. It brings a comprehensive view of the entire sub-systems in the car, the system's components and their interconnection, functions, operation, signals and diagnosis under hands-on safe activities.
The Autotronics laboratory consists of a set of simulators, trainers and equipment listed on the left side.
The laboratory's equipment is accompanied by the appropriate software to run interactively with PC workstations, wherever this is applicable.

When the available program interfaces and interacts the PC with a simulator, it offers support in all the above training procedures and creates realistic simulations. The student is able to change the data and the parameters of the system. The programs present schematically the results of the adjustments performed by the student.

The didactic content of the software is organized in subjects corresponding to the simulations and the experimental exercises with scope:
- A series of aims for the specific experiment and the level of knowledge that must be obtained.
- Theoretical background relevant to the lesson as well as practical examples of use.
- Tests/Questions for the students and fault testing.

All systems are accompanied with manuals for theory and exercises or electronic books. Each one of the lab equipment is described hereinafter. The system also offers a student response system (optionally) on theoretical and practical quizzes, tests or exams, which also the teacher can create. The schematics on software display or on panel display for all subsystems follow the symbols as specified by the DIN/IEC regulations.

FP-300
Autotronics Trainers

FP-311
CAN BUS Simulator

FP-312
ABS 4 Channel System Demonstrator

PT-AU/481
Automotive Electrical Trainer

PT-A-033
Engine Starting & Ignition System

PT – FP210
Vehicle Sensor System

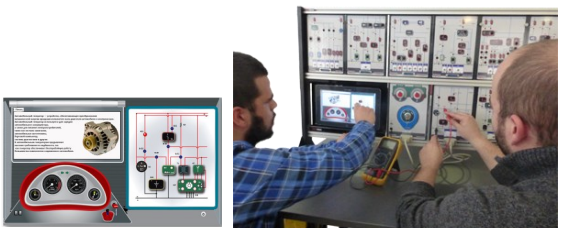
PTS-3572
Engine Sensors & Actuators Simulator

PTS-3545
Electronic Ignition Demonstrator

PTS-3546
Multipoint Injection Demonstrator

PT-5
Electronic Stability Control ABS+ASR+EDB+ESP

FP 300 Trainer
Autotronics Trainer



The tabletop Autotronics **FP300 T** simulator, connected to the PC, guides the user (via FP300 VS software), step-by-step in using the simulation in order to practice in **all Automotive Electrical circuits** and to perform virtual and real measurements simultaneously.
This educational modular system includes the simulator blocks for the electrical systems of the automobile to be used by the teacher and/or the **FP300 ST** for the student, with **10 modules** FP300 of electronic boards having printed drawings explaining the interconnection and the operation of each electrical sub system.
The 10 basic modular board can be interchanged between teacher and student at anytime.
The sections of the electrical system of an automobile are reproduced and simulated by the following modules:

FP301	Start Engine
FP302	Power Supply, Start and Ignition
FP303	Fuel Injection
FP304	Starter, Ignition and Fuel Injection for Large Vehicles
FP305	Dash board Engine Indicators
FP306	Cooling and ventilation module
FP307	Automotive Cabin circuits
FP308	Windscreen wipers and heating
FP309	Signal Indicators
FP310	Side lights, beam lights and fog lights block

The system is accompanied by **FP300 VS** application, a **CAI** - Computer Assisted Instruction - software, including **virtual instrumentation software** and **virtual electrical circuit testing software** demonstrating the relative theory as well as simulators software showing graphically the operation of the circuit on the computer.

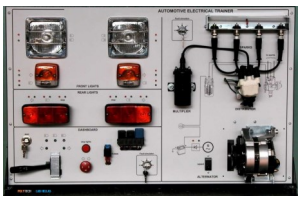
FP 311 Trainer/Simulator
CAN BUS Simulator

FP311 is the simulation unit of the FP300 series which introduces the students to the basics of the **CAN-BUS architecture signal** and **measurement process** in modern Autotronics.
As all FP300 series modules, FP311 is a simulator where the student can simulate **ECU-CAN-BUS** electronic signals and measure them using the FP300 application software while also measure actual signals on the trainer boards of FP300 series**.** FP311 is supplied as a **stand-alone simulator** providing training in samples of CAN BUS automotive control subsystems.

FP 312 Trainer
ABS 4 Channel System Demonstrator

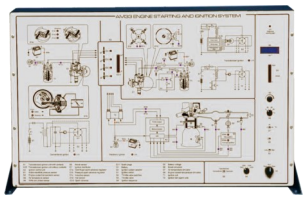
The FP 312 includes the simulation of the operation for basic components and modules of **4 channel ABS Braking system**. The experimenting panel includes the system drawings with test points and banana sockets.
It is operated with a PC which in parallel offers a virtual operational simulation, signal display and virtual instruments for measurements in the experimental/training work.

PT-AU/481 Trainer
Automotive Electrical Trainer



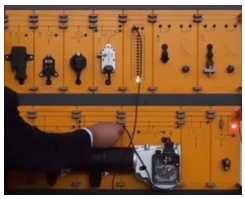
A desktop Trainer, demonstrating all **basic electrical components of a car**, mounted on this vertical panel, interconnected in a close circuit that allows fault simulation and repairing for hands on experience in the basic electrical circuits of the automobile.

PT-A-033 Simulator
Engine Starting And Ignition System



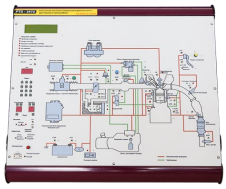
The board has graphic diagrams which will provide comprehension of system operation. The manuals provide a complete series of theory and exercises. Also, introduction of system's basic faults is possible. By this simulator, the main types of ignition systems are analyzed: conventional with coil, transistorized with Hall or inductive sensor, and electronic ignition.

PT – FP210 Trainer system
Vehicle Sensor System



This trainer allows you to **test the basic parameters of operations of the important sensors** which are used in **automotive systems**. Using real automobile sensors, on vertical frame modular panels, students can be trained in the critical operation of each sensor system, the combined operation of them, test their signaling and feedback process and evaluate their performance parameters in each automotive subsystem.

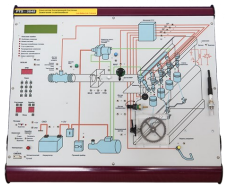
PTS-3572 Simulator
Engine Sensors And Actuators Simulator



The PTS 3572 simulator enables the student to perform several experiments and covers at minimum the following topics for the **various sensors and actuators subsystems** in an automobile:

- Engine Sensors: temperature, pressure, knock, flow, position, speed and oxygen;
- Air control system and Idle air control;
- Fuel delivery system and Injection system;
- Ignition system and spark plugs;
- Exhaust gas oxygen & temperature sensors;
- Solenoid operation, finding and repair of open circuit of position sensor of Exhaust Gas;
- Recirculation valve, short solenoid of EGR valve and partially short solenoid of the Early Fuel Evaporation valve;
- Fault troubleshooting of various sensors, transducers, solenoids and valves;
- Troubleshooting and repair of different operational modes, like leakages, in the starting system etc.

PTS-3545 Simulator
Electronic Ignition



TOPICS
The simulator enables the student to perform several experiments and covers at minimum the following topics for the **electronic ignition subsystem** in an automobile:
- Centralized injection system;
- Electronic ignition system type E-DIS;
- Sparks producing and sparks not producing ignition;
- Secondary circuit waveforms;
- Triggering pulse;
- Current restriction in primary circuit and ignition angle;
- Ignition timing;
- Engine revolutions (speed) and ignition timing;
- Engine load and ignition timing;
- Engine temperature and ignition timing;
- Knock control;
- RPM measurements;
- MAP sensor;
- Sensors and valves system;
- OBDII diagnosis connector.

PTS-3546 Simulator
Multipoint Injection Demonstrator

TOPICS
The PTS 3546 simulator enables the student to perform several experiments and covers at minimum the following topics for a Multipoint Injection, subsystem in a automobile:
- Fuel delivery;
- Fuel pump safety circuits;
- Intake air mass measurement;
- Air density and temperature;
- TPS: Throttle Position Sensor;
- Electromagnetic injectors;
- Injection duration and system operation;
- Injection pulses analysis;
- Injection duration at idle operation;
- Injection duration with load;
- Circuit cut-out during fuel overflow;
- Idle air control;
- 2 sensors;
- Fault simulation and Troubleshooting.

PT-5 Trainer
Electronic Stability Control ABS and ASR and EBD and ESP

ELECTRONIC STABILITY CONTROL TRAINER
This Trainer makes up a complete test packet on one of the most up-to-date active control systems for vehicle motion. The electronic control board performs the analysis of the dynamic state via a set of advanced electronic sensors, for measurement of the wheels speed, the steering wheel position and the horizontal acceleration.
The plant controls the following functions:
- Breaking system (ABS);
- Traction control (ASR);
- Electronic breaking distribution (EBD);
- Stability control (ESP).