

S E R I E S  
TPS-3546

## MULTI POINT INJECTION

## DEMONSTRATOR



### Objectives

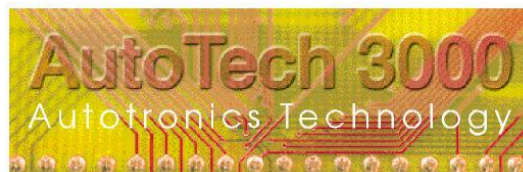
The TPS-3546 Automotive Multipoint Injection Training Demonstrator is designed to provide students with automotive training program introducing various systems and real components in modern cars.

The demonstrator brings a comprehensive view of the entire system in the car, the system's actual components and their interconnection, functions, operation, signals, diagnosis and repair methods under hands-on safe activities.

### Description

The demonstrator includes real and simulated components controlled by internal controller that produces the signals for measurement according to its internal simulating program or according to PC simulation programs.

The demonstrator's panel is with colored graphics clearly presenting the system components, connections and inter-relations with test points for real measurements and LEDs describing the component status.



# S E R I E S

# TPS-3546

## Multi Point Injection Demonstrator

### Technical Characteristics

The demonstrator is in a wide metal case with a colored printed circuit experiment panel (80 x 60 x 10 cm), which ensures easy handling and good visibility of the components and the simulation part.

The demonstrator includes real components and simulation components modules. The experimenting panel includes the system drawings with test points and banana sockets.

The demonstrator can be operated as a stand-alone system without a PC, guided by experimental book using built in oscilloscope or an external oscilloscope.

The demonstrator can be connected to a PC in serial communication (RS232 or USB) using SES-CBT courseware and SESCOPE software for signal display.

Student PC can be connected to the teacher PC for monitoring, course management, and records by SESML software (optional).

#### The system includes

- A power switch with indicating light
- SESLAB 2 channel digital oscilloscope
- 7 segment display and control switches, one for fault insertion unit and one for selecting simulation mode
- Eight (8) LEDs to indicate troubleshooting state
- Status mode switches and display
- Warning indicating light
- Graphic and Alphanumeric LCD display 64X240 pixels
- Numeric keyboard
- CAN-BUS interface
- Serial or USB communication interface with the PC
- PC / MANUAL switch
- 12V Power adapter
- Digital multimeter
- Operating and simulation switches
- Simulation potentiometers including: Manifold Air Mass, Manifold Air Pressure and Air Temperature sensors
- Main switch and main switch relay

- Fuel delivery system simulation
- Injection system Bosch type
- Light bar indicating injection duration
- ECU combined ignition and injection
- Vacuum pump
- Air control module
- Throttle control including Throttle Position Sensor (TPS)
- O2 simulation sensor
- Coolant temperature sensor
- Engine load simulation potentiometer
- Speed LED display
- Speaker
- Vacuum meter
- RPM 7 SEG display

### Experiments

This system enables the student to perform several experiments and covers the following topics:

- 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
- O2 sensor
- Troubleshooting

An experiment manual for the student and instructor manual accompany the system.



 Scientific Educational Systems  
20a Eilau Eithan Rishon LeZion  
P.O.B 5340 Rishon LeZion 75151 Israel  
Tel: 972-3-9412457, 9412459 Fax: 972-3-9412425  
e-mail: sesltd@netvision.net.il



