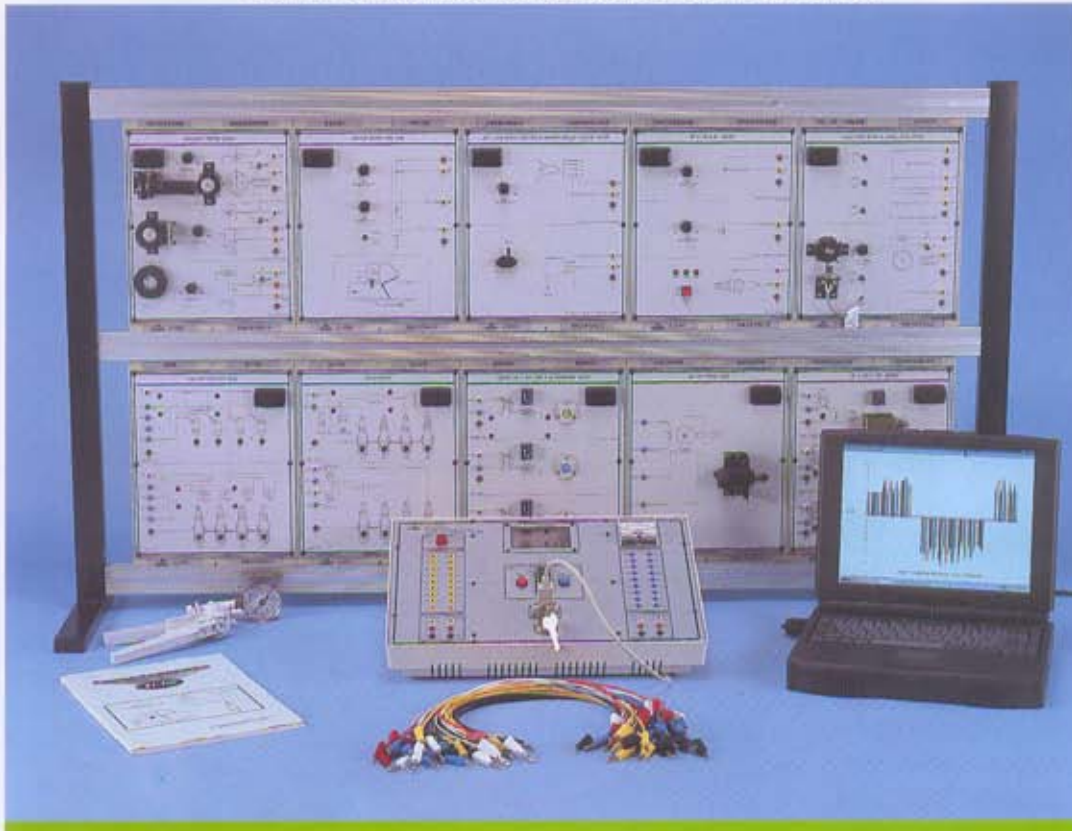


## AUTOTRONIC TRAINING SYSTEM

KL-800

### Computerized Interactive System for Autotronics



This modular system provides Electronics and Autotronics training by study and experiments on educational technological modules.

All theoretical, experimental and practical learning procedures are assisted and supervised by a Personal Computer and dedicated software

#### **FEATURES:**

- 89C51 computer interface monitor control.
- For Fuel Injection, Ignition and Exhaust Gas system computer control experiment.
- Can be assembled to become the injection system.
- With trouble-shooting simulator function.
- Switch-off input/output function when trouble-shooting is made.
- Build-in and external power supply for safety.

KL-800

## AUTOTRONIC TRAINING SYSTEM

### KL-81001 Main Unit



### KL-81001 Main Unit

#### 1. Power Supply Unit

Fixed DC Power Supply

- a. Output Voltage: +5V, +12V
- b. Max. Output Current: +5V/2A, +12V/2A
- c. With Output overload protection

#### 2. Computer Interface

RS-232C Port: 9 pin D-sub connector.

#### 3. CPU

Single-Chip Processor: 89C51

#### 4. Display

- a. LCD Graphic Display: 64x128
  - (1) With Back-light
  - (2) Synchronously display following values  
NE, PHO, HALL, MAF, MAT, MAP, TPS, CTS, VSS, IPW
- b. Analog Meter  
Oxygen's Sensor



LCD Graphic Display

#### 5. Selectors

- a. Select: NE, PHO, HALL
- b. Mode: Fuel Injector select  
(1) Sync. (2) Non-sync. (3) Sequence

#### 6. Input Signals

NE, PHO, HALL, VAF, MAT, F/C, MAF, MAP, TPS, CTS, O2, P/N, A/C, PSPS, VSS, 3GR

#### 7. Output Signals

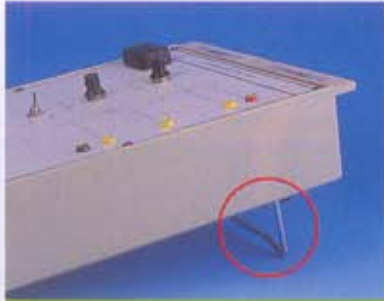
- a. INJ1, INJ2, INJ3, INJ4, SPK1, SPK2, SPK3, SPK4, FANC, F/C, ACC, IAC1, IAC2, IAC3, IAC4, TCC, CCP, EGRV
- b. CHECK ENGINE Lamp

### Experimental Modules

- a. 4mm plugs and sockets used throughout, connected by 4mm test leads
- b. Circuits symbols, blocks and components printed on the surface of each module
- c. Modules secured in plastic housing, the dimension: 297x226x60mm
- d. With storage cabinet for all modules to be easily stored
- e. Comprehensive experiment manuals
- f. All modules equipped with 4/8 bit DIP switch for fault simulation.

## AUTOTRONIC TRAINING SYSTEM

KL-800



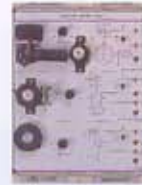
Stand feet for easy operation on the Workbench



Storage cabinet for all modules to easy storing



All modules equipped with 4/8 bit DIP switch for fault simulation



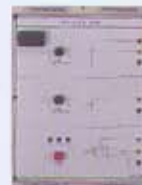
KL-83001



KL-83002



KL-83003



KL-83004



KL-83005



KL-83006



KL-83007



KL-83008



KL-83009



KL-83010

### List of Modules

Module KL-83001	Crankshaft Position Sensor
Module KL-83002	Air-Flow Sensor (Vane Type)
Module KL-83003	Air-Flow Sensor(Hot-Line)& Manifold Absolute Pressure Sensor
Module KL-83004	TPS, CTS & O2 Sensor
Module KL-83005	P/N, A/C, PSPS Switch & Vehicle Speed Sensor
Module KL-83006	Fuel Injectors/Spark Plugs
Module KL-83007	Ignition System
Module KL-83008	Cooling Fan & Fuel Pump & AC Compressor Relays
Module KL-83009	Idle Air Control Valve
Module KL-83010	TCC & CCP & EGRV Solenoid

### List of Experiments

#### (1) Crankshaft Position Sensor

- Pick-Up Sensor
- Photo Interrupt Sensor
- Hall IC Sensor

#### (2) Air-Flow Sensor (Vane Type)

- Output Voltage: 0.2V-3.5V
- Thermal Resistor MAT Output: 2.3V-2.7V
- Fan Control: F/C switch

#### (3) Air-Flow Sensor (Hot-Line) & Manifold Absolute Pressure Sensor

- Hot-Line Experiment
- Output Voltage: 1.0V-3.5V
- Manifold Absolute Pressure Sensor Experiment



**KL-800**

## **AUTOTRONIC TRAINING SYSTEM**

### **(4) TPS, CTS & O2 Sensor**

- a. TPS Experiment  
Output Voltage: 0.5V-4.5V
- b. CTS Experiment  
Output Voltage: 0.5V-4.5V  
Voltage level: 4.5V/-40°C, 2.3V/20°C, 0.5V/108°C
- c. O2 Sensor Experiment  
Normal: 0.1-1.0V swing  
Rich: 0.6-1.0V swing  
Lean: 0.1-0.3V swing

### **(5) P/N, A/C, PSPS Switch & Vehicle Speed Sensor**

- a. P/N Switch: Park-Neutur Switch
- b. A/C Switch: Air-Condition Switch
- c. PSPS Switch: Power Steering Pressure Switch
- d. Speed Sensor: Speed adjustable & 3GR switch

### **(6) Fuel Injectors/Spark Plugs**

- Fuel Injectors Experiment
- a. Static Load: 18Ω
- b. Normal rotation speed 800 rpm, max. rotation speed 3000 rpm
- c. Sequential Changeable
- d. Fuel Injectors LED display
- Spark Plugs Experiment  
LED display

### **(7) Ignition System**

- Ignition System Experiment (a)
- a. Static Load: 2Ω
- b. LED Display
- Ignition System Experiment (b)
- a. Static Load: 1Ω
- b. LED Display

### **(8) Cooling Fan & Fuel Pump & AC Compressor Relays**

- Cooling Fan Relay Experiment
- a. Control Signal: FANC
- b. DC 12V Motor
- c. Operational Conditions: A/C signal ON or CTS signal is 108°C or CTS signal is under 108°C
- Fuel Pump Relay Experiment
- a. Control Signal: F/C
- b. DC 12V Motor
- c. Operational Conditions: Air-Flow F/C signal ON and with rotation speed
- AC Compressor Relay Experiment
- a. Control Signal: ACC
- b. DC 12V Motor
- c. Operational Conditions: A/C signal ON

### **(9) Idle Air Control Valve**

- a. Control Signal: IAC1, IAC2, IAC3, IAC4
- b. Step Motor
- c. Operational Conditions: P/N, A/C, PSPS signal ON

### **(10) TCC, CCP, EGRV, Solenoid**

- Torque Converter Clutch
- a. Control Signal: TCC
- b. DC 12V Solenoid
- c. Operational Conditions: VSS signal is over 40Km and 3GR switch ON
- Carbon Canister Purge Valve
- a. Control Signal: CCP
- b. DC 12V Solenoid
- c. Operational Conditions:
  - c-1 rpm is over 1200
  - c-2 CTS is over 65°C
  - c-3 TPS is 1.0-2.5these three conditions synchronously exist, the CCP is ON

### **Exhaust Gas Recirculation Valve**

- a. Control Signal: EGRV
- b. DC 12V Solenoid
- c. Operational Conditions:
  - c-1 rpm is over 1200
  - c-2 CTS is over 65°C
  - c-3 TPS at 1.0-2.5
  - c-4 MAP at 1.0-1.5these four conditions synchronously exist, the EGRV is ON

### **(11) Accessories (KL-88001)**

- (1) One set of 4mm-4mm multilam, stackable test leads
- (2) User's Guide & Experiment manual
- (3) Power Cord
- (4) Storage cabinet
- (5) Rack Frame