



KL-800A

CAN BUS Autotronic Training System



*Notebook is excluded

The KL-800A CAN BUS Autotronic Training System is a distributed control system supported by advanced serial bus system CAN (Controller Area Network). CAN is a multi-master bus with an open, linear structure with one bus line and equal nodes. The number of nodes are not limited by the protocol.

Each module of KL-800A system is an ECU or the interoperable device (node) on CAN BUS. Data transfer between modules is achieved by the micro-controllers over CAN BUS. When signals and data are sent to personal computer, the computer monitoring system displays the current status and data of module on PC screen and turns on the warning light if something is wrong.

The KL-800A system can simulate the operation of fuel injection system, ignition system and exhaust gas control. Experiments include the characteristic and operation of various sensors and actuators used in automobiles.

► Features

- CAN-compliant modules can be easily connected together using the 9-pin D-sub connectors and cables. These modules can interoperate with each other.
- User-friendly GUI design allows the user to display and control modules on PC screen.
- Each module is equipped with fault simulation switches for troubleshooting practice.

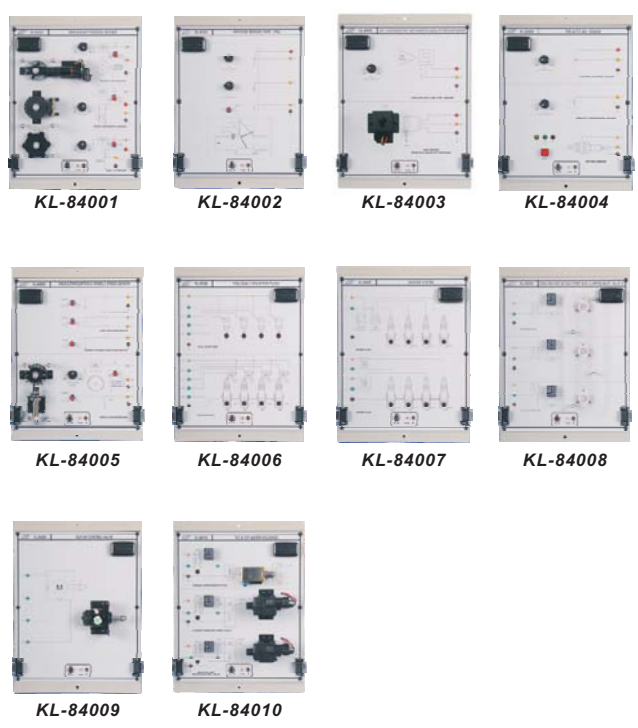
► Specifications

- 1. Power Supply**
 - (1) DC voltage: +12V
 - (2) Maximum current: 5A
- 2. System Requirement**
 - (1) IBM PC or compatible (option)
 - (2) NI CAN BUS USB interface card
- 3. Experimental Modules**
 - (1) Equipped with 2mm terminals for testing and checking
 - (2) Circuit symbols and block diagrams printed on the surface of module
 - (3) Module secured in plastic housing; module dimensions: 297x226x60mm ±10%
 - (4) Modules put in the experimental frame for demonstration and experiment
 - (5) Equipped with fault simulation switches

► List of Modules

- KL-84001 Crankshaft Position Sensor
- KL-84002 Air-flow Sensor (Vane Type)
- KL-84003 Air-flow Sensor (Hot Wire) & Manifold Absolute Pressure Sensor

- KL-84004 TPS & CTS & O₂ Sensor
- KL-84005 P/N, A/C, PSPS, 3GR Switch & Vehicle Speed Sensor
- KL-84006 Fuel Injectors / Spark Plugs
- KL-84007 Ignition System
- KL-84008 Cooling Fan & Fuel Pump & A/C Compressor Relays
- KL-84009 Idle Air Control Valve
- KL-84010 TCC & CCP & EGRV





► List of Experiments

1. Crankshaft Position Sensor

- (1) Pick-up coil, photo interrupter, hall-effect IC
- (2) Switches : NE, PHO, HALL
- (3) With CAN BUS control interface

2. Air-Flow Sensor (Vane Type)

- (1) VAF output voltage : 0.5V ~ 4.5V
- (2) Thermistor MAT output voltage : 0.3V~4.5V (110°C ~ -5°C)
- (3) F/C switch : Controlled by the RPM adjustable knob
- (4) With CAN BUS control interface

3. Air-Flow Sensor Hot Wire & Manifold Absolute Pressure Sensor

- (1) Air flow sensor (hot wire type)
MAF output voltage : 0.5V ~ 4.5V
- (2) Manifold absolute pressure sensor
MAP output voltage : 1.2V ~ 3.6V (-80kpa~0kpa)
- (3) With CAN BUS control interface

4. TPS & CTS & O₂ Sensor

- (1) Throttle position sensor (TPS)
TPS output voltage : 0.5V ~ 4.5V
- (2) Coolant temperature sensor (CTS)
 - a. CTS output voltage : 0.3V ~ 4.5V
 - b. CTS voltage/temperature : 4.3V/-5°C, 3.7V/10°C, 3V/25°C, 2.2V/40°C, 1.2V/65°C, 0.3V/110°C
- (3) O₂ sensor
 - a. O₂ output voltage
 - Normal : 0.1 ~ 1.0V
 - Rich : 0.6 ~ 1.0V
 - Lean : 0.1 ~ 0.3V
 - b. Selection switch for selecting normal, rich and lean
- (4) With CAN BUS control interface

5. P/N, A/C, PSPS, 3GR Switch & Vehicle Speed Sensor

- (1) P/N switch : Park/Neutral switch
- (2) A/C switch : Air Conditioning switch
- (3) PSPS switch : Power Steering Pressure Switch
- (4) Vehicle speed sensor
Speed adjustable : 0 ~ 120km/hr
- (5) 3GR switch
- (6) With CAN BUS control interface

6. Fuel Injectors/Spark Plugs

- (1) Fuel injector control
 - a. Coil resistance of injector : 18Ω
 - b. Maximum engine speed : 3600rpm
 - c. Selectable injection modes : Synchronous, Non-synchronous, sequential
 - d. Injection sequence displayed by LEDs
- (3) With CAN BUS control interface

7. Ignition system

- (1) Single-output ignition coil
 - a. Coil resistance : 2Ω
 - b. Computer-controlled ignition displayed by LEDs
- (2) Double-output ignition coil
 - a. Coil resistance : 1Ω
 - b. Computer-controlled ignition displayed by LEDs
- (3) With CAN BUS control interface

8. Cooling Fan & Fuel Pump & A/C Compressor Relays

- (1) Cooling fan
 - a. Control signal : FANC
 - b. 12V DC motor driven
 - c. Actuating conditions : A/C switch ON or coolant temperature sensor (CTS) signal higher than 108°C
- (2) Fuel pump
 - a. Control signal : F/C
 - b. 12V DC motor driven
 - c. Actuating conditions : F/C switch of vane air flow sensor ON and engine running (RPM signal)
- (3) A/C compressor
 - a. Control signal : ACC
 - b. 12V DC motor driven
 - c. Actuating condition : A/C switch ON
- (4) With CAN BUS control interface

9. Idle Air Control Valve

- (1) Step motor driven
- (2) Control signals : IAC1, IAC2, IAC3, IAC4
- (3) Actuating conditions : P/N or A/C or PSPS switch ON/OFF
- (4) With CAN BUS control interface

10. TCC & CCP & EGRV Solenoid

- (1) TCC control
 - a. Control signal : TCC
 - b. 12VDC solenoid valve
 - c. Actuating conditions : vehicle speed sensor (VSS) signal higher than 40km/hr and 3GR switch ON
- (2) CCP control
 - a. Control signal : CCP
 - b. 12VDC carbon canister purge valve
 - c. Actuating conditions
 - RPM signal : engine speed faster than 1200 rpm
 - CTS signal : coolant temperature greater than 65°C
 - TPS output voltage : 1.0 ~ 2.5V
- (3) EGRV control
 - a. Control signal : EGRV
 - b. 12VDC exhaust gas recirculation valve
 - c. Actuating conditions :
 - RPM signal : engine speed faster than 1200 rpm
 - CTS signal : coolant temperature greater than 65°C
 - TPS output voltage : 1.0 ~ 2.5V
 - MAP output voltage : 1.6 ~ 1.8V
- (4) With CAN BUS control interface

► Accessories (KL-89002)

1. 9-pin D-sub RS-232 cables :
 - (1) 180cm male-to-female cable : 1 pce
 - (2) 40cm female-to-female cable : 1 pce
2. NI CAN BUS USB interface card
3. AC adapter : 12VDC / 5A
4. Manual vacuum pump
5. Experiment manual, instructor manual, CD for KL-800A
6. Power cord
7. Rack frame (KL-89003)
8. Connector leads : 2mm-2mm : 1set