



KL-800A

CAN BUS Autotronic Training System



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 is 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 a 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 characteristics and operation of various sensors and actuators used in automobiles.

● Features

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

● Specifications

1. Power Supply
 - (1) DC voltage : +12V
 - (2) Max. 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

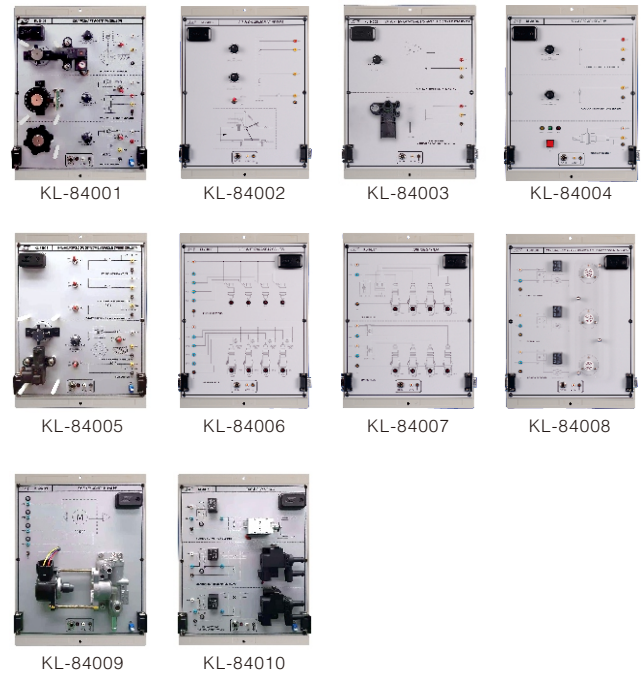
List of Modules

1. Crankshaft Position Sensor (KL-84001)
 - (1) Pick-up coil sensor, sensor photo interrupter, sensor hall-effect IC
 - (2) Output : NE, PHO, HALL
 - (3) With CAN BUS control interface
2. Air-Flow Sensor (Vane Type) (KL-84002)
 - (1) VAF output : 0.5V ~ 4.5V
 - (2) MAT output : 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 (KL-84003)
 - (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 ~ 0)
 - (3) With CAN BUS control interface
4. TPS & CTS & O₂ Sensor (KL-84004)
 - (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) Oxygen sensor
 - a. O₂ output voltage
 - Normal : 0.1V ~ 1.0V
 - Rich : 0.6V ~ 1.0V
 - Lean : 0.1V ~ 0.3V
 - b. Selector switch for selecting normal, rich and lean
 - (4) With CAN BUS control interface
5. P/N, A/C, PSPS, 3GR Switch & Vehicle Speed Sensor (KL-84005)
 - (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 (KL-84006)
 - (1) Fuel injector control
 - a. Coil resistance of injector : 18Ω
 - b. Max. engine speed : 3600rpm
 - c. Selectable injection modes : synchronous, non-synchronous, sequential
 - d. Injection sequence displayed by LEDs
 - (2) With CAN BUS control interface



7. Ignition system (KL-84007)
 - (1) Single-output of ignition coil
 - a. Coil resistance : 2Ω
 - b. Computer-controlled ignition displayed by LEDs
 - (2) Double-output of 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(KL-84008)
 - (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 (KL-84009)
 - (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 (KL-84010)
 - (1) Torque converter clutch
 - 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) Carbon canister purge valve
 - 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: 1.0V ~ 2.5V
 - (3) Exhaust gas recirculation valve
 - 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 : 1.0V ~ 2.5V
 - MAP output voltage: 1.6V ~ 1.8V
 - (4) With CAN BUS control interface



List of Experiments

- Experiment 1 Engine Speed Sensors
- Experiment 2 Air-Flow Sensors
- Experiment 3 Throttle Position Sensor
- Experiment 4 Coolant Temperature Sensor
- Experiment 5 Oxygen Sensor
- Experiment 6 Vehicle Speed Sensor
- Experiment 7 Third Gear Switch
- Experiment 8 Park/Neutral Switch
- Experiment 9 Air Conditioning Switch
- Experiment 10 Power Steering Pressure Switch
- Experiment 11 Injector Circuit
- Experiment 12 Computer-Controlled Ignition System
- Experiment 13 Cooling Fan Relay Circuit
- Experiment 14 Fuel Pump Relay Circuit
- Experiment 15 A/C Compressor Relay Circuit
- Experiment 16 Idle Air Control Valve
- Experiment 17 Torque Converter Clutch
- Experiment 18 Carbon Canister Purge Valve
- Experiment 19 Exhaust Gas Recirculation Valve
- Experiment 20 Car Computer

● Accessories (KL-89002)

1. 9-pin D-sub RS-232 Cables :
 - (1) 180cm male-to-female cable x 1 pce
 - (2) 40cm female-to-female cable x 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-97002)
8. Connector Leads : 2mm-2mm x 1set
9. Storage Cabinet (KL-99001) x 2 sets