The KL-620 Microcomputer Sensing Control Equipment is a comprehensive sensor/transducer control training system that incorporates industrial-grade components with various control circuits. Its modular and closed-loop control circuits allow implementation of open-ended, individual control loops used in industrial applications.

The KL-620 uses only industrial-standard sensors/transducers (0~10V, 4~20mA) and is equipped with RS-232 for computer interface control experiments. Control programs can be written and down-loaded to the Single-Chip microprocessor on KL-62001 main unit from computer through RS-232 interface.
1. Power Supply Unit
   Fixed DC Power Supply
   (1) Output Voltage: +5V, -5V, +12V, -12V
   (2) Max. Output Current:
       +5V/3A, -5V/0.3A, +12V/1.5A, -12V/0.3A
   (3) With Output Overload Protection

2. Interface Ports
   (1) RS-232C Interface: 1x25pin D-sub connector

3. Status Display & DCV
   (1) Input Voltage Measurement
       A. Range : 2000mV, 20V
       B. Accuracy : ±0.05% of reading + 4 counts
       C. Input Impedance : 10MΩ
       D. Display : 4-1/2 digits
   (2) Sensor Input Measurement
       A. Sensor Types : TEMP, %RH, LUX, WEIGHT, AUX
       B. Accuracy : ±0.05% of reading + 4 counts
       C. Display : 4-1/2 digits

4. Preset Level: 4-digit thumbwheel switch, Max. value: 4095

5. Single-Chip & EPROM
   (1) Single-Chip Processor: 8031
   (2) 8 Control Line Outputs
   (3) DRAM: adjustable sensor reference value
       ZIP sockets for both single chip processor & EPROM
   (4) EPROM: 2764 or equal IC

6. D/A Converter: 1 x 12-bit DAC
   (1) Resolution: 1.22mV/bit
   (2) Analog Output & Control
       OUT+ : +DC OFFSET 0V~+4.096V unipolar
       OUT– : -DC OFFSET 0V~+4.096V unipolar
       OUT BP : DC OFFSET –2.048V~+2.048V bipolar

7. A/D Converter: 1x12-bit ADC
   (1) Resolution: 1.22mV/bit
   (2) Input Voltage Range: 0 ~ +5V
   (3) Time Pulse Frequency: 3.579545 MHz
   (4) Control Signals: state, pole, over voltage indication

8. Amplifiers
   (1) Instrumentation Amplifier: ± Vi input, Vo output, adjustable gain
   (2) Differential Amplifier: ± Vi input, Vo output
   (3) Comparator: ± Vi input, Vo output
   (4) Alarm Amplifier: buzzer with driver circuit

9. Selectors
   (1) PIO/Single-Chip Selector
   (2) Manual/Single-Chip Selector

10. Potentiometer: 100KΩ , B-type

11. Accessories
   (1) Demo Diskettes
   (2) Connect Leads: A. 0.65mm-0.65mm, 150mmL, 10pcs
       B. 0.65mm-0.65mm, 300mmL, 15pcs
       C. 2mm-0.65mm, 300mmL, 10pcs
   (3) Cable: A. 5P-5P, (F-F), 60cmL, 1pc
       B. 25P-25P (F-M), 100cmL, 1pc
   (4) User's manual
   (5) Fuse
   (6) AC cord
   (7) Anti-Dust cover
Experiment Modules

**Standard Modules: KL-64001 ~ KL-64008**

- KL-64001: Photo Transistor/Interrupter & Hall Effect Sensor
  2. Characteristics and Applications of Magnetic Sensors.
- KL-64002: Pyroelectric Detector & Reed Switch & Thermistor & Mercury Switch Sensor
  1. Characteristics and Applications of Pyroelectric Detector.
  2. Characteristics and Applications of Reed Switch.
  3. Characteristics and Applications of Microphones.
- KL-64004: Gas/Smoke & Ethanol Sensor
  1. Principles and Applications of Gas/Smoke Sensors.
- KL-64005: AD590 Temperature & Humidity Sensor
  1. The Construction of the AD590 Temperature Transducer.
  2. The Characteristics of the AD590.
  3. The Transduction Principles of the AD590.
  4. The Applications of the AD590.
  5. The Classification of Humidity Sensors.

**Option Modules: KL-64009 ~ KL-64016**

- KL-64009: Infrared TX/RX & Ultrasonic TX/RX Sensor
  1. The Characteristics of Infrared (IR) Transducers.
  2. The Driver Circuits of IR Transducers.
  3. The Receiver circuits of IR Transducers.
  4. The Applications of IR Transducers.
  5. The Characteristics of Ultrasonic Waves.
  7. The Transmission and Reception of Ultrasonic Waves.
  8. The Applications of Ultrasonic Transducers in the Filed of Incremental Control and Instrumentation.
- KL-64010: Pressure & Strain Gauge Sensor
  2. The Operating Principles of a Pressure Transducer.
  3. The Applications of a Pressure Transducer.
  4. The Principle of a Strain Gauge.
  5. The Construction of a Strain Gauge.
  6. The Characteristic of a Strain Gauge.
  7. The Transduction Circuit of a Strain Gauge.
  8. The Application of a Strain Gauge.
- KL-64007: Hall Current & Proximity Sensor
  2. The Application of a Light Control Circuit.
  3. The Characteristics of a Photoelectric Converter.
  4. The Principles of Photoelectric Conversion.
  5. The Applications of Photoelectric Cells.
- KL-64011: F/V Converter
  1. The Principles of Voltage-to-Frequency Conversion.
  2. The Principles of Frequency-to-Voltage Conversion.
  3. The Operation of a Photo Encoder.
KL-64012: RTD (PT-100) Sensor
(1) The Characteristics of Resistance Temperature Detector (RTD).
(2) The Construction of a Pt-100.
(3) The Characteristics of a Pt-100.
(4) The Transduction Circuit of a Pt-100.
(5) The Application of a Pt-100.

KL-64013: Level (Water) Sensor
(1) The Digital Circuit.
(2) The Principle of the Level Control.

KL-64014: Fiber Optics Communication
(1) The Construction of the Optical Fiber and the Characteristics.
(2) Fiber Optical TRANSMITTER and RECEIVER.

KL-64015: LVDT Sensor
(1) The Construction of a LVDT.
(2) The Characteristics of a LVDT.
(3) The Signal Conditioner for a LVDT.
(4) The Applications of a LVDT.

KL-64016: Rotation Angle Sensor
(1) Principles and Application of Rotation Angle Sensor.

List of Modules

STANDARD MODULES: KL-64001 ~ KL-64008

KL-64001
(1) Photo Transistor
(2) Photo Interrupter
(3) Magnetic (Hall-Effect) ~ Digital
(4) Magnetic (Hall-Effect) ~ Analog
(5) Accessories: Magnet, 1PC
(For KL-64001 and KL-64002 uses)

KL-64002
(1) Pyroelectric Detector
(2) Reed Switch
(3) Thermistor
(4) Mercury Switch

KL-64003
(1) Limit Switch
(2) Vibration Switch
(3) Condenser Microphone
(4) Dynamic Microphone

KL-64004
(1) Gas/Smoke Sensor
(2) Ethanol Sensor

KL-64005
(1) IC (AD590) Temperature Sensor
(2) Humidity Sensor
  a. Humidity transducer rated voltage: 1 Vp-p AC
  b. Frequency range: 100Hz ~ 10KHz
  c. Temperature range: 0°C ~ 60°C
  d. Humidity range: 20%RH ~ 90%RH
  e. Impedance: 13kΩ (70%RH at 25°C)

KL-64006
(1) Infrared TX/RX Sensor
  a. Infrared Transmitter: emission intensity: 12mW/sr
     (I = 50mA)  
     emission wavelength: 940nm
     (I = 50mA)
  b. Infrared receiver: sensitivity wavelength: 1000nm
(2) Ultrasonic TX/RX Sensor
  a. Nominal frequency: 40KHz

KL-64007
(1) Pressure Sensor
  a. 0-7 psi to 0-30 psi pressure ranges
(2) Strain Gauge
  a. Maximum payload: <5kg
  b. Terminal resistance: 350 ± 50 ohm
(3) Accessories:
  a. Suction pump, 1PC  b. Plastic tube: 25cm, 1PC

KL-64008
(1) Hall Current Sensor
  a. Normal input current: ±3A DC (if)
  b. Linear range: 0 ~ ±6A DC
  c. Output voltage: 4.5V±0.005V at+ if, 0.5V+ 0.005V at– if, Rl = 10Ω
(2) Proximity Sensor
  a. Operation voltages: 10 ~ 30V DC
  b. Short circuit protection
(3) Accessories: Proximity switch 1PC

Accessories (KL-68013)
(1) Experimental Manual
(2) Connect Leads: A. 2mm-0.65mm, 5pcs
       B. 2mm-2mm, 10pcs

OPTION MODULES: KL-64009 ~ KL-64016

KL-64009
(1) CDS Sensor
(2) Photovoltaic Sensor
  a. Photovoltaic transducer open voltage: <2V
  b. Photovoltaic transducer close voltage: <0.06 μA/lux

KL-64010
(1) V/F Converter
  a. Input voltage: +10mV ~ +10V
  b. Output frequency: 5Hz ~ 5KHz, 10Hz ~10KHz

KL-64011
(1) F/V Converter
  a. Input frequency: 0 ~ 4.3KHz (±0.2Vp ~ ±5Vp)
  b. Output voltage: 0 ~ 4.3V DC

KL-64012
(1) RTD (PT-100)
  a. 0°C: 100Ω, 100°C: 139.16Ω
  b. Rating: 250°C
  c. Accessories: PT-100 Sensor Probe

KL-64013
(1) Level (Water)
  a. Simulation of the reservoirs control status (motor included)
  b. Accessories: plastic case

KL-64014
(1) Fiber Optics Communication
  a. Power launched versus fiber length:
     (1) 0~28M (I : 100mA)
     (2) Type: P: 1µW; L: 13M; I: 100mW
  b. Accessories: Optical fiber cable

KL-64015
(1) LVDT
  a. Range: ±5mm
  b. Scale: 0.01mm
  c. Optimum frequency: 50Hz ~ 1.1KHz (Nominal: 350Hz)

KL-64016
(1) Rotation Angle Sensor
  a. 10 turns (360°) precision potentionmeter
  b. Linearity: ± 0.25%