COMPUTER INTERFACE CONTROL TRAINER

CIC-200

The Computer Interface Control (CIC) training program is a modularized approach to computer interfacing techniques and control applications. The CIC program is designed to provide comprehensive hands-on training for students.

The CIC system consists of main unit (CIC-200) and four modules: CI-23001: Keyboard/Display Module
CI-23002: Sensor Module
CI-23003: Stepper Motor Module
CI-23004: Servo Motor Module

The CIC provides a complete training program which includes a student experiment manual for each training module. Coupled with these experiment manuals, it provides the student an awareness into computer interfacing techniques and control techniques.

* When ordering the application control modules, should add CI-18001 power module to complete the experiment.

CIC-200 COMPUTER INTERFACE CONTROL TRAINER

SPECIFICATION:
(1) 8 × 7 Segment Display.
(2) Programmable Input/Output: 8255
(3) Programmable Counter/Timer: 8253
(4) Matrix Keyboard: 4×4
(5) Time Pulse Generator: Kitchen the system time pulse for 2, 4, 8, 16
(6) Pulse Generator: 2 toggle switches.
(7) Logic Indicator: 2 × 8 bit LED
(8) Logic Level Switch: 1 × 8 bit DIP switch.
(9) Accessory: Keyboard/display experimental manual

Sensors are the most important elements in measurement systems as well as control systems. Sensors convert real world physical phenomena into some types of amount that can be processed by electronic circuits.

The Sensor Module consists of four sensors: Light, Moisture, Magnetism and Temperature. Coupled with the CIC-200, we can actually observe the physical phenomena in real world. The sensor module also has a serial communications port RS-232C which is a standard equipment for personal computer.

2. CI-23002 SENSOR MODULE
(1) Installing the Sensor Software
(2) Installing and Testing the Sensor Hardware
(3) Data Logger Operation
(4) Multiplexer Operation
(5) Uart Operation
(6) Testing the Power Driver
(7) Calibrating the Sensors

SPECIFICATION:
(1) Thermocouple Sensor: K Type
(2) Magnetic Sensor: Hall Effect
(3) Light Sensor: Photo-transistor
(4) Humidity Sensor: High Impedance Electro Panel
(5) UART
(6) Power Driver: 1/2 W
(7) Accessories:
① Sensor Experimental Manual
② Magnetic × 1
③ K Type Thermocouple × 1
④ Hall Sensor × 1
⑤ Optic-fiber Cable
⑥ High Impedance Electro Panel

Stepper motors are widely used in computer peripheral equipments such as printers and disk drivers and in areas of industrial control where light loads must be run through precise angles or to precise distances.

Contrary to conventional motors, steppers do not rotate continuously. Instead, they rotate a predetermined amount each time. They are excited by a digital signal. For instructional reasons, the stepper motor used in our module has 48 poles and steps in 7.5 degree increments.

3. CI-23003 STEPPER MOTOR MODULE
(1) Installing the Stepper Motor Software
(2) Installing and Testing the Stepper Motor Hardware
(3) 4-Phase Sequencing
(4) Stepping Speed
(5) Sequencing Through a Process

SPECIFICATION:
(1) Stepper Motor: DC +5V, 1A, 4ϕ, 7.5°/Step.
(2) Accessory: Stepper Motor Experimental Manual

DC servo motors, driven by electronic amplifiers, have been in use for a long time. During that time, improvements in electronic amplifiers has led to improvements in servo performance.

In the experiment manual, we will discuss the fundamentals of servoc systems and apply some computer control technology to study and operate them. The servo module used in the experiments is modest in terms of performance, but it is well suitable for demonstrating the operating principles and problems associated with servos. We will solve some of these problems through computer software. In general it is easier and cheaper to solve problems through software than through hardware.

4. CI-23004 SERVO MOTOR MODULE
(1) Installing the Servo Software
(2) Installing and Testing the Servo Motor Hardware
(3) Measuring Potentiometer Linearity
(4) Calibrating the Potentiometer
(5) Sequencing a Servo
(6) Graphing the Servo
(7) Damping

SPECIFICATION:
(1) DC Servo Motor: DC12V
(2) Gear Ratio: 40:1
(3) Closed-Loop Control: VR, 10KΩ ± 20%, Linear ± 2%
(4) Accessory: Servo Motor Experimental Manual

9. Digital Gain
   (1) A digital programmable gain circuit.

10. Function Generator
   (1) Sine/TTL output with AM, FM and FSK control.
   (2) Standard Freq: 303HZ, ±6%
   (3) Output: Sine, TTL level
   (4) Input: A. FM: = 0 ~ 3V (3300 ~ 300HZ)
   B. AM: (a) Impedance: 100K
   (b) Range: 10 ~ 2V
   (c) Modulation, DSB, Shift, limit carrier
   C. FSK: TTL output

11. Amplifiers
   microphone and inverter
   (1) Microphone amplifier:
   A. Voltage gain: 43 dB
   B. Max. output voltage: 15V p-p
   C. Max. input voltage: 0.1V p-p
   D. Freq. response: 100 ~ 2000HZ, ±3dB
   (2) Inverter: A. Max. input voltage: 10V p-p
   B. Max. output voltage: 10V p-p
   C. Gain accuracy: ±2%

12. Audio Amplifier
   (1) With speaker and volume control
   (2) Output: 0.5W
   (3) Gain: 30dB
   (4) Max. Input Voltage: 5V p-p
   (5) Input Impedance: 100KΩ
   (6) Max. Load: 8Ω
   (7) Freq. response: 400 ~ 3000Hz, ±3dB

13. Interface Cable
   (1) A 60-pin IDC connector to link the bus.

14. Input/Output Connecting Sockets
   (1) 4 types Analog connectors: BNC
   ⅛" Microphone jack, phone connector and
   10K potentialmeter port

15. Solderless Breadboard: 840 tie point

16. Pulse Generator
   (1) 2 pulser generator of operating as DMA, interrupt request interfaces, or as a polled I/O latch.

17. Accessories: (CI-28002)
   (1) 60-pin connection cable, F-F, 60cm
   (2) PC buffer card
   (3) Demo disk
   (4) Connect leads: A. 0.65mm ~ 0.65mm, 150mm, 20pcs
   B. 0.65mm ~ 0.65mm, 300mm, 20pcs
   C. 2mm ~ 2mm, 600mm, 3pcs
   (5) 25-pin, D-connector, M-M, 200mm
   (6) Microphone
   (7) Anti-Dust cover
   (8) Fuse
   (9) AC cord
   (10) User's manual

18. General
(1) Power Source: AC 110V/220V, ±10%, 50/60Hz
(2) Operating Temperature: 0°C ~ 50°C
(3) Humidity: <90% RH
(4) Dimension: 400 × 300 × 130mm
(5) Weight: Approx. 4Kg

Application Control Modules (Option)


CI-23001


CI-23003


CI-23002


CI-23004

FEATURES:

1. *2mm plugs and sockets used throughout*
2. *Comprehensive experiment manuals*
3. *Modules secured in plastic housings*
4. *Connection by 0.65mm-0.65mm test leads*
5. *Dimension: 255 × 165 × 30mm*
6. *Circuit symbols, blocks and components printed on the surface of each module*
7. *Power supplied from either power module or through CIC-200 main unit*

Keyboard and display processing technologies have become a part of our everyday life providing us with consumer electronic products such as digital clocks, calculators, video games, and VCRs, etc. For as common as these technologies are, the majority of the population has no idea how they actually work or how easy it is to handle them as functional blocks and design them into new products.

The Keyboard/Display Module (KBD) is a valuable extension to your CIC. The KBD module coupled with the CIC-200 makes it easy to experiment with these devices as well as understand them in depth.

The keyboard / display experiments require that you are familiar with operating the CIC-200 unit and that the CIC-200 is connected to an AT-compatible computer. We recommend that you have completed the CIC-200 experiments before proceeding with the all application control modules experiments.

1. CI-23001 KEYBOARD/DISPLAY MODULE
   (1) Installing the Keyboard/Display Software
   (2) Installing the Keyboard/Display Hardware
   (3) Display
   (4) Keypad
   (5) CTC (Counter Timer Chip) (Programmable Clock)
   (6) CTC (One Shot)

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