

CIC-800A

INTERFACE LAB



An interface is a hardware and software data transmission regulator that controls data exchange between the PC and other peripheral devices, including RS-232C, AT-BUS, IDE, SCSI, ISA, PCI, AGP, IrDA, GPIB, USB, IEEE-1394, Wireless etc...

Each interface device inherits different specifications such as transmission rate, data format, protocol and applications. Accordingly, learners can familiarize with each kind of interface devices.

CIC-800A contains multi-purpose interfaces modules, inclusive of serial port (RS-232C), parallel port (Centronics) and universal serial bus (USB2.0) that can be used for various peripheral devices. Add-on modules are available for experiment purpose. The RS-232C and Centronics interface firmware adopt Atmel's chipset modules, and use Microsoft Visual C++ 6.0 as developing tools.

The USB 2.0 interface firmware adopts Cypress's chipset modules, and uses Microsoft Visual C++ 6.0 as developing tools. By learning traditional and popular interfaces, users can reap the benefits. Additionally, we also provide source codes and execution files for further studying.

Features

Containing protocols of USB 2.0, RS-232C, and Centronics

1. USB Interface

- (1) Comply with high speed USB 2.0 specification
- (2) Support four transfer types: Isochronous, Bulk, Control, Interrupt
- (3) Provide debugging and development environment-Keil C compiler
- (4) Directly download firmware via USB interface for supporting software operation and eliminating the requirements of external program memory or Mask ROM
- (5) Support Re Enumeration operation to build a predestined endpoint
- (6) Use Cypress USB microcontroller CY7C68013-100AC TQFP, compatible with 8051
- (7) Operate in stand-alone mode after the application program download (with external power supply)
- (8) Provide 8051 40-pin expansion connector for simulating 8051 I/O ports P0, P1 and P2
- (9) Provide two UART serial ports (one for Keil C debugger)
- (10) Provide 3.3V I/O interface

2. RS-232C and Centronics Interfaces

The microcontroller AVR8515 features:

- (1) Program Memory : 4K x 16 = 8K x 8 of In-System Programmable (ISP) Flash, 1000 write/erase times
- (2) 512 bytes of In-System Programmable EEPROM, 100000 write/erase times
- (3) 32 tri-state programmable I/O lines (PA0-PA7, PB0-PB7, PC0-PC7, PD0-PD7)
- (4) 32 x 8 general purpose working registers
- (5) 512 bytes of SRAM
- (6) 2.7 to 6.0 V operating voltages, 0 to 20 MHz fully Static operating frequencies

- (7) 50 ns instruction cycle at 20 Mhz
- (8) One 8-bit timer/counter with separate prescaler
- (9) One 16-bit timer/counter with separate prescaler compare, capture modes
- (10) One full duplex UART port
- (11) Dual 8-, 9- or 10-bit PWM output
- (12) Internal and external interrupt sources
- (13) Programmable watchdog timer with on-chip oscillator
- (14) On-chip analog comparator
- (15) Low-power idle and power down modes
- (16) Programming lock for Flash program and EEPROM data security
- (17) Large I/O drive current-sink 20mA (max 40mA) and source 10mA at 5V
- (18) Master/Slave SPI serial interface
- (19) 64K bytes of external SRAM
- (20) Program memory can be reprogrammed by ISP loader through SPI serial port

System Requirements

1. Hardware requirements

- (1) Pentium II or better
- (2) 200MB free hard-disk space
- (3) minimum 32MB RAM

2. Software requirements

- (1) Windows 2000/XP
- (2) EZ-USB Control Panel (on CyConsole installation CD, generated when installing)
- (3) Keil C 4K educational version (on installation CD, generated when installing)
- (4) Microsoft Visual C++ 6.0 (optional, source code IP and executable file provided in experiments)



Micro-Computer/Internet Educational Equipment

Specifications

1. USB ICE Unit (CI-83002B)

- (1) Single-chip integrated USB 2.0 transceiver, SIE and enhanced 8051 microprocessor
- (2) Software: 8051 runs from internal RAM, downloaded via USB or loaded from EEPROM
- (3) For transfer modes: Bulk/Interrupt/ isochronous/control
- (4) 8- or 16-bit external data interface
- (5) Integrated industrial standard 8051
- (6) 3.3 VDC operating voltage
- (7) Smart Serial Interface Engine (SIE)
- (8) Vectored USB interrupts
- (9) Separate data buffers for SETUP and DATA portions of a CONTROL transfer
- (10) Integrated I2C-compatible controller
- (11) 8051 can be operate at 48 MHz, 24 MHz, or 12 MHz
- (12) Four integrated FIFOs
- (13) Special autovectors for FIFO and GPIF interrupts



2. I/O Unit (CI-83001)

- (1) Two sets of 8-bit LED display
- (2) 4-digit 7-segment display
- (3) 20 x 2 character LCD
- (4) 8-bit ADC
- (5) 8-bit DAC
- (6) Power indicator
- (7) 8 tact switches
- (8) One 8-bit DIP switch
- (9) 40-pin male connector
- (10) Operating voltage provided by an external 8-VDC adapter



3. USB Interface Unit (CI-83002)

- (1) Two UART connectors
- (2) USB B-type connector
- (3) 40-pin expansion connector for external 8052
- (4) Selectable external EEPROM
- (5) Communicate with CI-83001 via a 40-pin expansion connector
- (6) Reset and Wake up buttons
- (7) Chip operating voltage: 3.3 VDC



4. RS-232C/Centronics Interface Unit (CI-83003)

- (1) RS-232C interface (D-SUB 9-pin)
- (2) Printer port interface (D-SUB 25-pin)
- (3) Control-line and status-line LED indicators
- (4) Transfer interface by AVR8515
- (5) RS-232C protocol
- (6) 40-pin male connector
- (7) 4-bit DIP switch for program settings



Experimental Modules

- (1) Circuit connections of Modules using the supplied jumpers to eliminate errors of wiring
- (2) Comprehensive Experiment Manual
- (3) Module installed in a squeeze-type molded aluminum case
- (4) Dimensions: 150 x 90 x 25 mm ± 10%

List of Experiments

- USB Experiments
 - (1) LED display control
 - (2) 7-segment display control
 - (3) Tact Switch control
 - (4) LCM display
 - (5) ADC
 - (6) DAC
 - (7) UART
 - (8) USB keyboard
 - (9) USB mouse
- RS-232C/Centronics Experiments
 - (1) Centronics Experiments
 - a. Digital output
 - Data-line output
 - Control-line output
 - b. Digital input
 - Status-line input
 - Status-line input, data-line output
 - (2) RS-232C Experiments
 - a. Digital input and output
 - Control-line output
 - Light flash control
 - Status-line input
 - b. Data transfer
 - Sending and receiving data
 - Automatically receiving data
 - Applications of data transfer
 - LED controlled by TXD data output
 - RXD receiving data
 - Synchronously sending and receiving data
 - DIP switch data receiving
 - Keypad data receiving
 - DAC application - data output
 - Digital voltmeter using ADC data input
 - Waveform display using ADC data input
 - Binary data sending and receiving (associated with 7-segment display and keypad)
 - ASCII character code sending and receiving (associated with 20 x 2 character LCD)
 - Character string sending and receiving (associated with 20 x 2 character LCD)
 - Changes of baud rates

Accessories

1. Experiment manual
2. 8-bit and 1-bit jumpers
3. USB cable, A-B type
4. RS-232C interface cable
5. Printer interface cable
6. 40-pin flat bus line
7. Software CD

Others

1. DC power supply : 8 VDC, 1 A
2. Operating temperature : 0 - 50°C
3. Relative humidity : < 90%