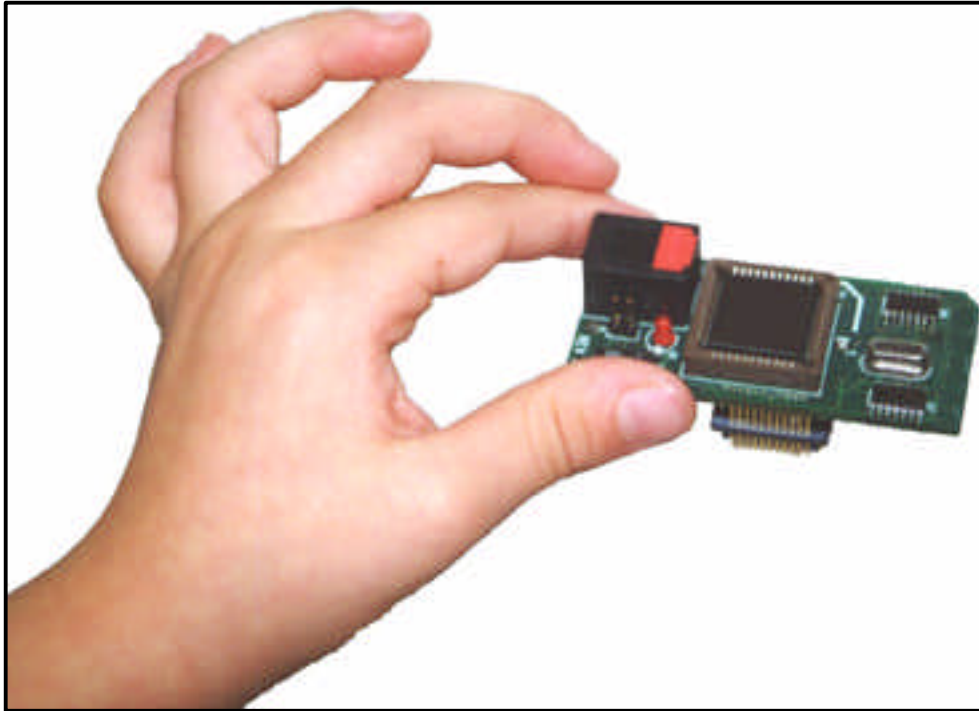


CEIBO FE-W7 Development System



Development System for Winbond W7xxxx Microcontrollers

FEATURES

- **Emulates Winbond W77xxx or W78xxx Microcontrollers**
- **125K Code Memory**
- **Real-Time Emulation**
- **Frequency up to fmax at 1.8V to 5.5V**
- **Wide Supply Voltage Support**
- **MS-Windows Debugger For C And Assembler**
- **Emulation Headers for PLCC, QFP and DIP**
- **Target Board and Programmer Included**
- **Serially Linked to IBM PC at 115Kbaud**

DESCRIPTION

Ceibo FE-W7 is a development tool that supports almost all 8051 derivatives Winbond Microcontrollers at any frequency allowed by the devices. It is serially linked to a PC or compatible systems and can emulate the microcontrollers using any clock. Emulation is carried out by loading the system with the user software and an embedded monitor program. FE-W7 locates the monitor in the upper 3K of the code memory space. The system uses standard devices for real-time and transparent emulation. The emulator is not frequency or voltage restricted, so it can be used to emulate the microcontroller in the complete range of parameters defined by the device. Three working modes are available: real-time, in-circuit simulation and simulator. In the real-time mode the user software is executed transparently and without interfering with the microcontroller speed. Breakpoints can be added to stop program execution at a specific address. The in-circuit simulation is used to provide a trace function by slowing down the emulation speed; instructions are executed by the simulator, except the peripheral related instructions. FE-W7 may be disconnected while using the simulation mode. The software includes C and Assembler Source Level Debugger, On-line Assembler and Disassembler, a limited C Compiler and many other features. The system is supplied with MS-Windows debugger software, RS-232 cable power supply, mechanical adapters and other accessories.

SPECIFICATIONS

SYSTEM MEMORY

FE-W7 provides up to 125K of user code memory depending on the microcontroller installed on the emulator. 3K is reserved to the emulator. Code memory cannot be mapped external and always belongs to the emulator system.

BREAKPOINTS

Breakpoints allow real-time program execution until an opcode is executed at a specified address.

WINDOWS DEBUGGER

The FE-W7 software includes a source level debugger for Assembler and high-level languages C and others with the capability of executing lines of the program while displaying the state of any variable. The debugger uses symbols contained in the absolute file generated by the most commonly used Assemblers and High Level Language Compilers. The CEIBO Windows Debugger runs only under Windows 95 or later and also under Windows NT, XP, etc.

SUPPORTED MICROCONTROLLERS

The supported microcontrollers depend on the chip installed. As it is on a socket, the user may replace it according to the needs.

Installed μ C	Supported μ C	Freq.	Voltage	Availble Code Mem.
W78E365	W78C32C W78E51B W78E52B W78E54B W78E58B W78E516B W78E858 W78C51D W78C52D W78C54 W78C58 W78C516 W78C801 W78E365	40MHz	5V	61K 4K 8K 16K 32K 61K 32K 4K 8K 16K 32K 61K 4K 61K
W78LE516	W78L32 W78L51 W78L52 W78L54 W78L801 W78LE51 W78LE52 W78LE54 W78LE58 W78LE516 W78LE812	40MHz	3V / 5V	61K 4K 8K 16K 4K 4K 8K 16K 32K 61K 8K
W77E532	W77C32 W77C58 W77C516 W77E58 W77LE58 W77E532	40MHz	5V	61K 32K 32K 32K 32K 125K

FREQUENCY

FE-W7 runs from the clock source supplied by a built in programmable clock generator. The minimum and maximum frequencies are determined by the emulated chip characteristics, while the emulator maximum frequency is 40MHz.

HOST CHARACTERSTICS

PC or compatible systems with 8 MByte of RAM, one RS-232C interface card for the PC, Windows 95 or later.

INPUT POWER

5V, 1.5A power supply supplied.

ITEMS SUPPLIED AS STANDARD

Development system including emulator, programmer and development board, PLCC emulation header, Windows software with source level debugger, on-line assembler and disassembler, user's manual, RS-232 cable and power supply.

OPTIONS

QFP and DIP adapters.

PARTS OF THE SYSTEM

The system includes 3 main hardware boards:

1. FE-W7 - In-circuit Emulator
2. DB-51RD2 - Development Board
3. MP-51RD2 Microcontroller Programmer

HARDWARE DESCRIPTION

FE-W7 EMULATOR

The first step required to work with the FE-W7 board is to be able to identify its different parts and to understand how the electronics function. This will help you to take full advantage of all the available capabilities of the FE-W7

On the bottom side of the FE-W7 you will see a phone jack. It is used to serially link the FE-W7 to your computer and to utilize the software in emulation mode instead of just the simulator. The emulation mode is used to interact with the hardware while the simulator is independent of any hardware connection. The RS-232 cable connections are given separately.

On the right side of the RS-232 connector you will see a POWER LED indicating whether or not the power is applied to the system.

The emulator must be connected to a target to be powered and to receive the clock input, otherwise it will not work.

If you do not have your target system, you can use DB-51RD2 Board that is included in the system.

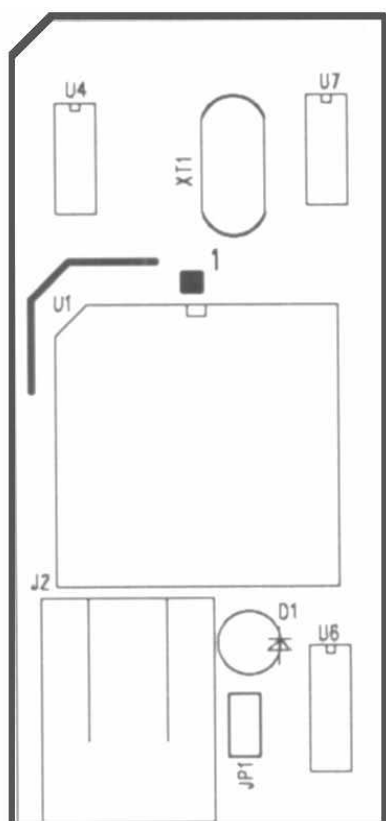


FIGURE 1: FE-W7 Emulator

U1 is the microcontroller used for your emulation. It is placed on a 44-PLCC socket. You may replace the supplied microcontroller by W78E365, W78LE516 or W77E532 to meet your emulation requirements.

On the other side of the board there is a PLCC plug that you must connect to a target board.

Make sure that pin #1 of your target is aligned to pin #1 of the emulator, which is clearly marked and has the same direction as U1.

JP1 is a connector necessary only for firmware updates. Make sure that the cap is not placed on it to work properly.

If any firmware update will be necessary, follow the instructions that will come with it in **www.ceibo.com**.

DB-51RD2 DEVELOPMENT BOARD

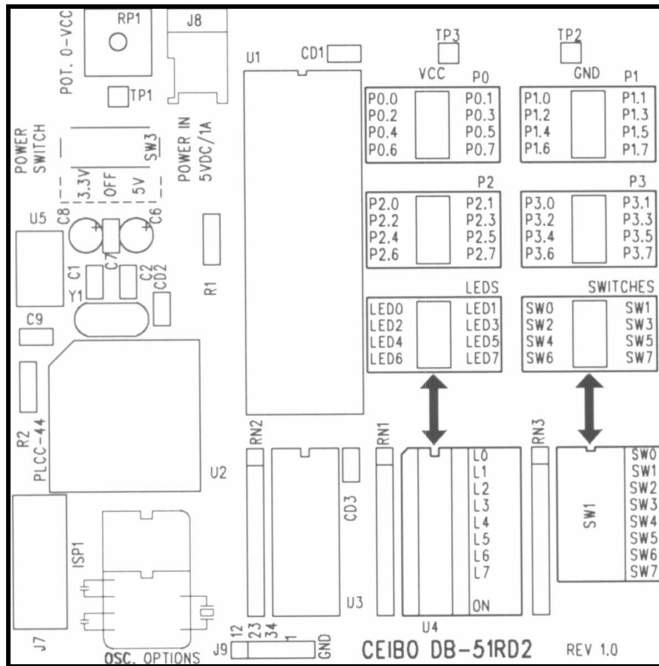


FIGURE 2: DB-51RD2 Development Board

This board is supplied to be used as a possible target and to test your software. It provides the following functionality:

- 1. Testpoints for Port lines.** Please note that Port 0 is open-drain and if you want to see a high level on these lines you must add pull-up resistors. The system includes a spare resistor network that can be plugged into the 40-pin socket of the target board to provide the pull-ups. This is shown in the following figure. Make sure that the common of the resistor network (1 common + pull-ups) is connected to pin 40, which is the Vcc line
- 2. LEDs.** One LED is the ON/Off indicator while L0 to L7 can be used to display high-levels while connecting them to the Ports or other signals. An 8-pin jumper is supplied for that connection.
- 3. Switches.** The SWITCHES connector provides logic states to input ports. The same supplied 8-wire ribbon cable can be used to connect the ports to the Switches, thus allowing to easily test your program.
- 4. Sockets.** DIP and PLCC for microprocessors can be connected to this board. You may connect FE-W7 emulator to PLCC-44 socket. In such a case, make sure that U1 socket does not have a microprocessor on it.

5. Power Switch. The power switch is on the left side of the board. It has three positions: OFF, 3.3V and 5V. Although the input voltage is always 5V, the system has a built-in voltage regulator (U5) that drops the voltage to 3.3V if the switch is set accordingly. Use the power supply included in the system and connect it to the Power In jack (J8).

6. Potentiometer. This 50KOhm potentiometer is used to get on TP1 analog input from 0 to Vcc (which is 3.3V or 5V according to the power switch position).

7. ISP Connector. J7 is an ISP connector that can be used directly with MP-51RD2 programmer to program the microcontroller installed on the 40-DIP or 44-PLCC socket. A 10-pin ribbon cable is supplied for this purpose.

8. Oscillator Options. This board can be used to connect a full size crystal oscillator (16-DIP), half size (8-DIP) or a 2-pin crystal with capacitors as shown on the board.

9. Future Options. The board is prepared to be used with future derivatives, which have pin signals not supported by the current derivatives and as shown on J9 connector. Additional frequency options for new derivatives are prepared with C1, C2 and Y1 crystal placements.

MP-51RD2 PROGRAMMER

This small board contain the RS-232 interface to ISP signals. Use it together with the supplied 10-pin ribbon cable and a software driver for Winbond derivatives.

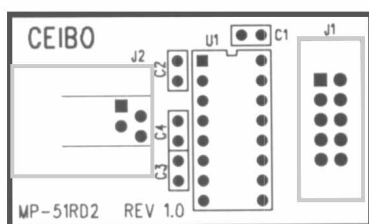


FIGURE 3: MP-51RD2 Programmer

EMULATION RESTRICTIONS

The following restrictions are valid for FE-W7:

1. FE-W7 Monitor Program shares 3 KByte of the available memory code space. Therefore, user programs can be up to 61K for 64K ports or 125K for 128K ports.
2. Code memory cannot be mapped external and always belongs to the emulator system.
3. The program also uses 4 Bytes of the internal stack memory.
4. The stack pointer may not be defined below address 7.
5. The first instruction (address 0000h) must be 3-bytes long. For example: use LJMP and not SJMP or AJMP as the first instruction.
6. The UART is shared with the system and interrupts should not be disabled. Also the related timer to the serial port must not be stopped. The Halt Mechanism in the Options Menu of Ceibo Windows Debugger offers other solutions in case you need these resources in your application.
7. Trace can be used to display the last executed instruction in real time. Trace is variable in depth and shows backward all the sequential instructions occurred (LJMP, ACALL, DJNZ, etc.).
8. Breakpoints cannot be set to the Reset Vector (address 0000h-0002h), Serial Interrupt (address 0023h-0025h) or to the 3K of the reserved memory. Any other location is allowed, included inside interrupt service routines. Changing breakpoints setting will activate ISP mode and reset the device.

FE-W7- ORDERING INFORMATION

<i>Item</i>	<i>Description</i>
FE-W7	Emulator for Winbond Microcontrollers in PLCC-44 package including DB-51RD2 Development Board and MP-51RD2 Microcontroller Programmer.
ADP-44Q-P	PLCC-44 to QFP-44 Adapter.
ADP-40D	PLCC-44 to DIP-40 Adapter.