



CYPRESS 
SEMICONDUCTOR

USB Development System

Software Guide

Version 4.1

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Introduction

The USB Development System Software is designed to be used with the USB Development Board to assist the users of Cypress USB IC's. The System Software provides users with a means of developing and debugging their own firmware.

The System Software provides an interface which opens up the access to various components on the Development Board, such as the Program ROM, Data RAM, I/O Space, and Registers. It also provides break point capability as well as user code download capability and list file trace tracking.

General

The USB Development System Software is a Windows 3.1/Windows 95 application.

Minimum System Requirements

- A 80486 or Higher personal computer.
- At least 8MB of RAM.
- At least 10MB of free Hard Disk space.
- Microsoft Windows version 3.1 or Windows 95.
- A 3.5-inch (1.44-MB) high-density floppy disk drive.

Software Installation (Win 3.1 & Windows 95)

In Windows 3.1, select the "File => Run" function in the Program Manager and type A:\SETUP.EXE and press <Enter> (where "A:" is the appropriate floppy disk drive).

OR

In Windows 95, select "Run" from the "Start Menu" and type A:\SETUP.EXE and press <Enter> (where "A:" is the appropriate floppy disk drive).

Follow the installation instruction in the setup program.

The installation program creates a USB Monitor Icon , "CM8MONxx" in the "CM8MONxx" Program Group where "xx" is the system software version number.

The USB Monitor/Debug Software

Getting Started

The USB Development System Software can be run by double clicking on the USB Monitor Icon. Communications can be established by setting the COM Port to the same RS-232 port that connects to the Development Board. Once the Development Board is connected and the software has loaded, the system software can download information to the board or read information from it, or control the operation of the Development Board.

Program Organization

The USB Development System Software provides two types of control for the system. The main menu is a typical Windows pull down menu. In addition to the main menu there is also a number of windows and buttons to control program functions. Figure 1 shows a view of the System Software when it is first started. The Data RAM, Registers/Flags, View, System Status, and List File window panes are the only window panes initially showing after start up. The Program RAM, I/O Space, Breakpoint and Download Object File window panes can be displayed by using the View window buttons or menu (Download Object File is not available in the View menu).

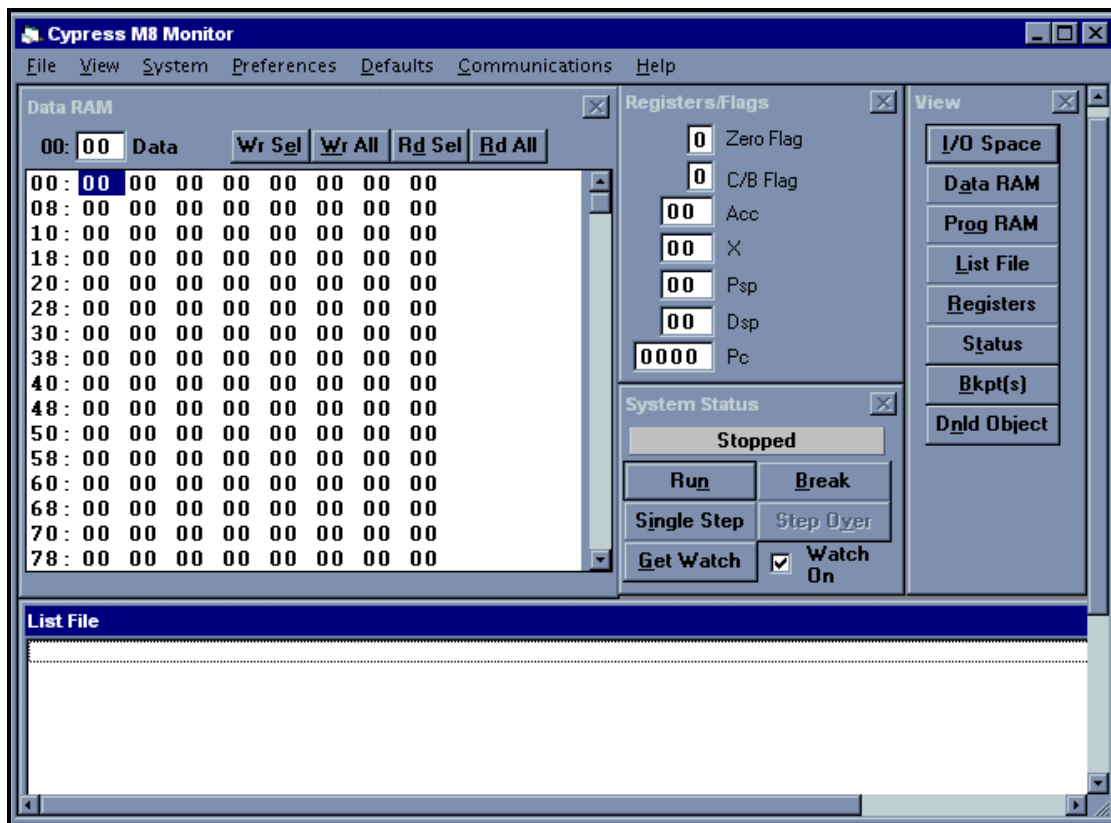


Figure 1

Windows and Button Controls

The I/O Space, Data RAM, Program RAM, List File, Breakpoint and Download Object window panes are re-sizable and can be moved to any location. The View, Registers/Flags, and System Status window panes are not re-sizable but can be moved to any location within the main window.

View Button Window

The View Button Window contains “buttons” which control the display of windows inside the main program window. Clicking on the buttons will open or close the particular window panes.

<i>I/O Space Button:</i>	Open/Close the I/O Space window.
<i>Data RAM Button:</i>	Open/Close the Data RAM window.
<i>Program RAM Button:</i>	Open/Close the Program RAM window.
<i>List File Button:</i>	Open/Close the List File window.
<i>Registers Button:</i>	Open/Close the Registers/Flags window.
<i>Status Button:</i>	Open/Close the System Status window.
<i>Bkpt(s) Button:</i>	Open/Close the Breakpoints window.
<i>Dnld Object Button:</i>	Open/Close the Download Object File window.

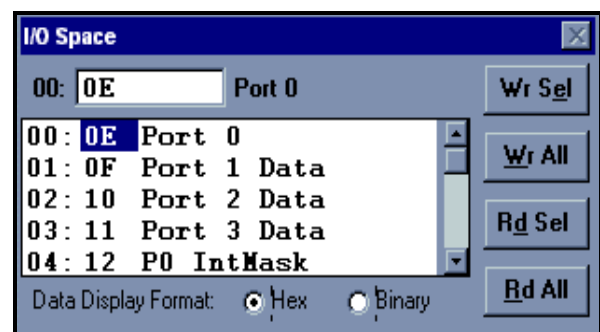


I/O Space Window

The I/O Space window provides the functions of displaying and altering the contents of the I/O Space addresses. Four buttons are provided for changing the contents of the I/O Space; *Wr_Sel*, *Wr_All*, *Rd_Sel*, *Rd_All*.

“Wr_Sel” will WRITE the highlighted address of the I/O Space with the contents of the data input box. The data input box is located above the data display window. “Wr_All” will WRITE the contents of the data input box to the entire I/O Space. Click on the data input box or use “Shift-Enter” to input data in the input box. The data format can be changed to hexadecimal or binary form by clicking on the *Data Display Format* choices of “Hex” or “Binary”.

“Rd_Sel” will READ the highlighted address of the I/O Space. “Rd_All” will READ the entire contents of the I/O Space. Use the scroll bar to scroll through all of the available I/O Space addresses.

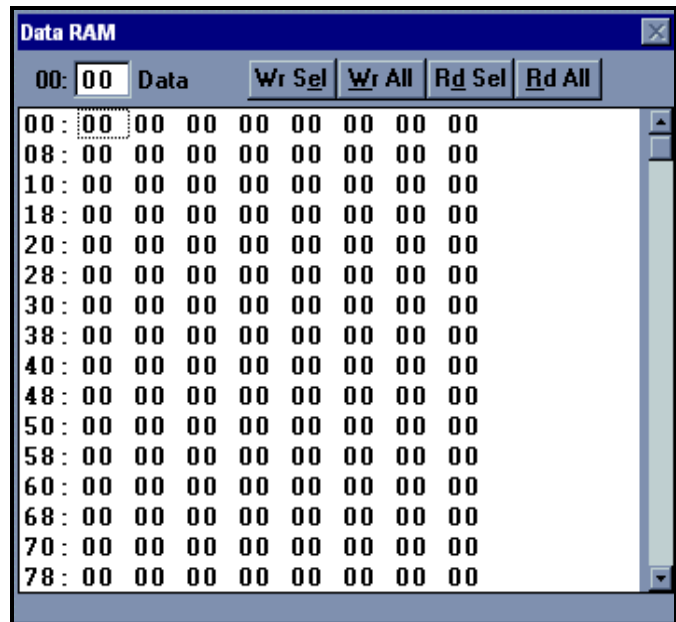


Data RAM Window

The Data RAM window provides the functions of displaying and altering the contents of the Data RAM. Four buttons are provided for changing the contents of the Data RAM; *Wr_Sel*, *Wr_All*, *Rd_Sel*, *Rd_All*.

“*Wr_Sel*” will WRITE the highlighted address of the Data RAM with the contents of the data input box. The data input box is located above the data display window. “*Wr_All*” will WRITE the contents of the data input box to the entire Data RAM. Click on the data input box or use “Shift-Enter” to input data in the input box.

“*Rd_Sel*” will READ the highlighted address of the Data RAM. “*Rd_All*” will READ the entire contents of the Data RAM. Use the scroll bar to scroll through all available Data RAM locations.

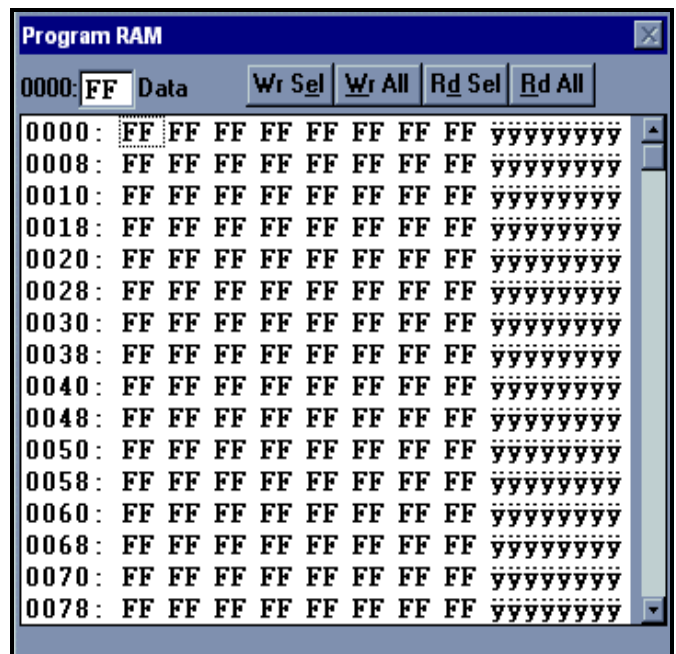


Program RAM Window

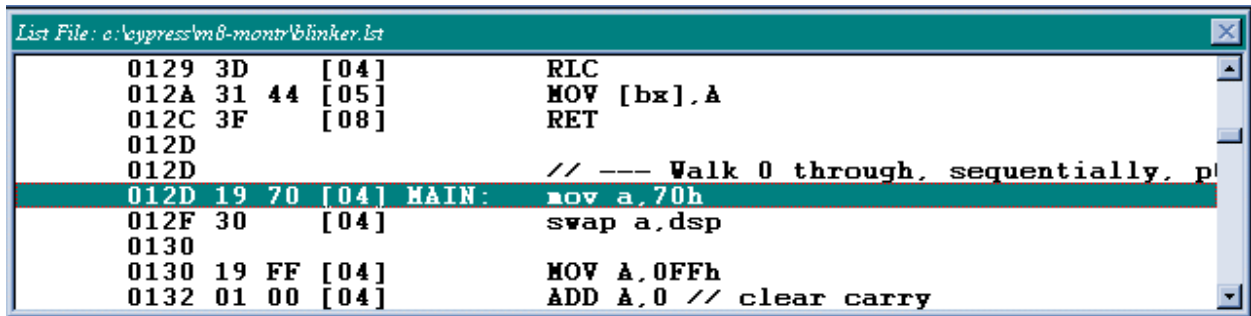
The Program RAM window provides the functions of displaying and altering the contents of the Program RAM. Four buttons are provided for changing the contents of the Program RAM; *Wr_Sel*, *Wr_All*, *Rd_Sel*, *Rd_All*.

“*Wr_Sel*” will WRITE the highlighted address of the Program RAM with the contents of the data input box. The data input box is located above the data display window. “*Wr_All*” will WRITE the contents of the data input box to the entire Program RAM. Click on the data input box or use “Shift-Enter” to input data in the input box.

“*Rd_Sel*” will READ the highlighted address of the Program RAM. “*Rd_All*” will READ the entire contents of the Program RAM. Use the scroll bar to scroll through all available Program RAM locations.



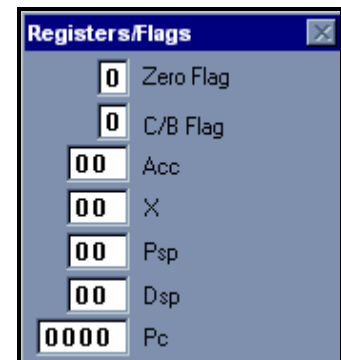
List File Window



The List File window displays the current list file which has been loaded. The list file can be loaded by using the File menu (the operation of the File menu is described in section 5.1) or by clicking on the “Load List File After Download” in the Download Object File Window (see Download Object File Window in section 4.9). Scrolling through the list file can be accomplished by using the scroll bar, arrow keys or “PgUp/PgDn” keys. By “double clicking” on a line in the list file window, a break point can be set or removed. Whenever the state of the development board toggles from a “Running” state to the “Stopped” state the “highlighted” line in the list file will reflect the current Program Counter contents.

Registers/Flags Window

The Register/Flags window displays the current values of the microcontroller registers and flags. The window will update any time the Development Board toggles from a “Running” state to the “Stopped” state or when the “Get Watch” button is clicked in the System Status window. The contents of the registers or flags can be changed by clicking in any of the display boxes, changing the contents, and pressing <Enter> or <Return>.



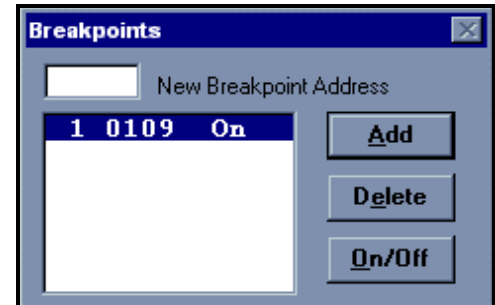
System Status Window

The System Status window displays the current “Running” or “Stopped” status of the Development Board. This window also has four buttons which controls the run status of the Development Board. *Run* will put the Development Board into “run” state. *Break* will cause the Development Board to stop executing. *Single Step* will single step the Development Board one instruction at a time. *Get Watch* will update the Registers/Flags window and the selected address in the Data RAM and I/O Space windows. *Get Watch* can be turned on by clicking on the “watch on” box. A check mark in the box indicates that *Get Watch* is on, no check mark indicates it is off. *Step Over* executes an entire routine of a call instruction and then stops at the next address. Selecting any of these buttons (except *Run*) causes updates to the Registers/Flags windows, and any highlighted fields in the Data RAM and I/O Space windows (depending on the preference settings, see section 5.4).



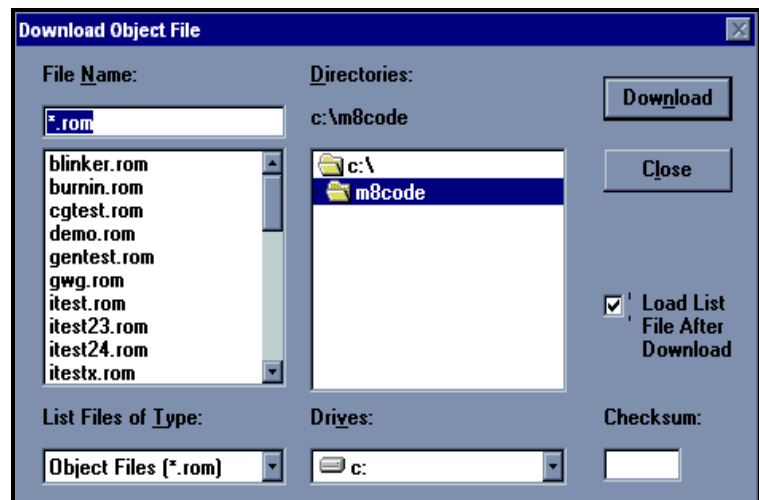
Breakpoints Window

The Breakpoints window displays the current breakpoints as well as providing the ability to Add, Delete, and Toggle breakpoints. The “Add” button adds whatever address has been inputted into the “New Breakpoint Address” data input box. The “Delete” button will delete whatever breakpoint is currently highlighted. The “On/Off” button will toggle the highlighted breakpoint on and off. In order to use breakpoints, the Development Board must be running from “Program RAM” (see the USB Development System User’s Guide).



Download Object File Window

The Download Object File window provides the function of downloading an object file to the “Program RAM”. The “download” button downloads the object file. The object file is a “*.rom” file output by the assembler. This file can be tested once it is downloaded to the “Program RAM”. The “cancel” button cancels the downloading process. Clicking on the “Load List File After Download” box will automatically display the list file when an object file is loaded. A check mark in the box indicates that “Load List File After Download” is on, no check mark indicates it is off. A “checksum” is available to ensure that the contents of the object file are correct. This value should match the checksum in the list file. To download an object file, the Development Board must be running from “Program RAM” (see the USB Development System Users Guide).



Main Menu

File Menu

The File Menu contains only file functions associated with the “List File” and “Program RAM” windows.

<i>Load List File:</i>	Load a selected List File (*.lst) into the “List File Window”. A List File is the listing file from the assembler displaying the program address listing of the assembled program.
<i>Unload List File:</i>	Unload the currently loaded from the “List File Window”. After this operation the “List File Window” will be empty.
<i>Download Object File:</i>	Download an Object File to the “Program RAM”. The Object File is a “*.rom” file output by the assembler. When this file is downloaded to the “Program RAM” it can be tested. The board must be properly configured to load the Program RAM; see the USB Development System User’s Guide.
<i>Load Project:</i>	Loads a project (setups, settings of windows and directory being used).
<i>Save Project:</i>	Saves the current project.
<i>Save Project As:</i>	Saves the current project with a new name.
<i>Exit:</i>	Close the USB Development System Software application.

View Menu

The View Menu contains the selections for opening and closing all of the program window objects in the main program window, except the Download Object File Window. Selecting an item is the same as clicking on a button in the View window (see Section 4.1) except the View Menu contains an additional selection, “View Bar” as shown below.

<i>Data Ram:</i>	Open/Close the Data RAM window.
<i>I/O Space:</i>	Open/Close the I/O Space window.
<i>List File:</i>	Open/Close the List File window.
<i>Breakpoints:</i>	Open/Close the Breakpoints window.
<i>View Bar:</i>	Open/Close the View Bar window.
<i>Registers/Flags:</i>	Open/Close the Register/Flags window.
<i>System Status:</i>	Open/Close the System Status windows.
<i>Program RAM:</i>	Open/Close the Program RAM window.

System Menu

The System Menu controls the “Run” status of the Development Board. Selecting an item is the same as clicking on a button in the System Status window (see Section 4.7).

<i>Run:</i>	Activate the “Run” status.
<i>Break:</i>	Break the “Run” status.
<i>Single Step:</i>	Single-Step the Development Board.
<i>Get Watch:</i>	Poll the System Status.
<i>Step Over:</i>	Run from a call routine to the next address.

Preferences Menu

The Preferences Menu is used to control the status of different features of the Development Board.

Watch Includes DRAM Selection, IO Sel:

When “Watch Includes DRAM Selection, IO Sel” is selected, the “Registers/Flags” window, the selected data in the “Data RAM” window, and the selected data in the “I/O Space” window will update automatically when the monitor detects that the system has halted.

Watch is Continuous When Target is Running:

When “Watch is Continuous When Target is Running” is selected, a “Get Watch” (see System Status Window in section 4.7 for more information on “Get Watch”) is done every second. (WARNING: This may corrupt USB data.)

I/O Space Data Format: From this menu selection two data types are selectable for displaying the I/O Space data values: Hex Number Format or Binary Number Format.

Save Project on Exit: When “Save Project on Exit” is selected, a project is automatically saved when exiting.

Development Board Setup:

This menu selection is used to select the Development Board model being used.

Defaults

The Defaults menu contains one menu choice to *Restore Default Window Arrangement* . Clicking on *Restore Default Window Arrangement* will restore the original arrangement of the window panes.

Communications Menu

The Communication Menu contains menu selections to control the properties of the RS-232 Communications Port to which the Development Board is connected.

Comm Port: Set the desired RS-232 Communications Port.

Timeout Interval: Set the Timeout Interval for communication failure determination.

Initialize Comm Port: Reinitialize Comm Port to recover from serial communication errors.

Help Menu

Help menu only contains program revision information.

About M8 Monitor: Displays program information dialog window showing program revision and copyright.

License

The USB Development System Software is licensed for use on a single PC equipped with the USB Development System Development Board (Part# CY3650, CY3651). The software may be copied for backup purposes only.