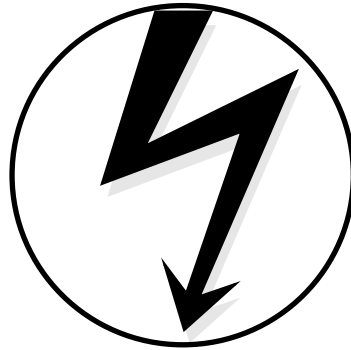




Z90259 ICEBOX

User's Manual

Electrical



Safeguards

WARNING!

Follow the precautions listed below to avoid permanent damage to the emulator.

- I. Always use a grounding strap to prevent damage resulting from electrostatic discharge (ESD).
- II. Power-Up Precautions.
 1. If the target application board has its own power, remove the U_VCC jumper J1 position 1-2 and set jumper J1 to position 2-3 on the Z90259 Emulation Board.
 2. Ensure that all power to the emulator and the target application (if any) is turned OFF.
 3. Connect the target pod to the target application (if any).
 4. Power up the emulator, then press the RESET button.
 5. Power up the target application (if any).

III Power-Down Precautions.

When powering down, follow this procedure in the precise order shown below:

1. Power down the target application board (if any).
2. Remove the target pod.
3. Power down the emulator.

NOTES:

1. Refer to the “Precaution List” section of the Product Information sheet for additional operating precautions specific to various devices.
 2. Do not leave the emulator powered up with the RS-232C cable connected to a powered-down PC.
 3. Before inserting target pod into target application board, refer to Chapter 2, “Setup and Install” to determine appropriate jumper selections and options.
-

©1999 by ZiLOG, Inc. All rights reserved. Information in this publication concerning the devices, applications, or technology described is intended to suggest possible uses and may be superseded. ZiLOG, INC. DOES NOT ASSUME LIABILITY FOR OR PROVIDE A REPRESENTATION OF ACCURACY OF THE INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED IN THIS DOCUMENT. ZiLOG ALSO DOES NOT ASSUME LIABILITY FOR INTELLECTUAL PROPERTY INFRINGEMENT RELATED IN ANY MANNER TO USE OF INFORMATION, DEVICES, OR TECHNOLOGY DESCRIBED HEREIN OR OTHERWISE. Except with the express written approval of ZiLOG, use of information, devices, or technology as critical components of life support systems is not authorized. No licenses are conveyed, implicitly or otherwise, by this document under any intellectual property rights.



Totally Logical

PREFACE

ABOUT THIS MANUAL

We recommend that you read and understand everything in this manual before setting up and using the product. However, we recognize that users have different styles of learning. Some want to set up and use their new emulator while they read about it; others use this manual for checking on a particular specification. Therefore, we have designed this manual to be used either as a how-to procedural manual or a reference guide to important data.

ADDITIONAL SOURCES OF INFORMATION

In addition to this manual, you should have access to and be familiar with the following documentation:

- Z8 Microcontrollers User's Manual, UM95Z800103
- Z90230 Family of Digital Television Controllers User's Manual, UM97TEL0700

DOCUMENT CONVENTIONS

The following conventions have been adopted to provide clarity and ease of use:

- Courier Font For Executables

Commands, variables, icon names, entry field names, selection buttons, code examples, and other executable items are distinguished by the use of the Courier font. Where the use of the font is not possible, like in the Index, the name of the entity is capitalized. For example, a procedure may contain an instruction which appears as: Click on `F`ile. However, an Index entry would appear as `FILE`.

- Grouping of Actions Within A Procedure Step

Actions in a procedure step are all performed on the same window or dialog box. Actions performed on different windows or dialog boxes appear in separate steps.

- Sequencing Words Within A Procedure Step

When an item in a procedure contains a series of actions, the second action is preceded by the word *then*, and the third and subsequent actions are preceded by the word *and*. For example: Click on **View**, then **Memory**, and **Z8 Code Memory**.

- Unavailable menu items are presented in gray.

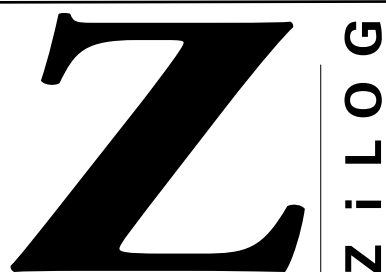


Totally Logical

TABLE OF CONTENTS

Chapter Title and Subsections	Page
Chapter 1. Introduction	
Overview	1-1
Supported Devices	1-1
Hardware Specifications	1-1
Operating Conditions	1-1
Power Requirements	1-2
Serial Interface	1-2
Emulation Memory	1-2
Hardware Breakpoints	1-2
Host Computer System	1-2
Minimum Requirements	1-2
Recommended	1-3
Additional Required Items Not Supplied with the Support Package	1-3
Optional Items Not Supplied with This Package	1-3
Chapter 2. Setup and Installation	
Installing the Software	2-1
ZDS Installation	2-1
ZDS Uninstallation	2-1
Installing the Hardware	2-1
Quick Installation	2-2
Complete Hardware Installation	2-3
Emulator Jumper Locations	2-6
Powering Up/Powering Down Procedures	2-7
Emulator Operation	2-8
Resetting	2-8
ZDS	2-8
Creating A New Project	2-9
Opening A Project and Adding Files	2-14

Chapter Title and Subsections	Page
Chapter 2. Setup and Installation (Continued)	
Available Debug Windows	2-18
Chapter 3. Troubleshooting Guide	
Introduction	3-1
ZDS Error Opening Serial Port	3-1
V _{CC} Contention	3-2
“Out of Synchronization with the Emulator” Message	3-2
Program Counter Jumps to Unexpected Address	3-2
Chapter A. ZiLOG on the Web	
ZiLOG's Web Site	A-1
Pre-Printed Documentation	A-1
Appendix B. ASCII Character Set	
ASCII Character Set	B-1



Totally Logical

CHAPTER 1

INTRODUCTION

OVERVIEW

The ZiLOG Z90259 ICEBOX™ Emulator is carefully engineered to provide the best balance between reasonable cost and useful features to shorten your development time for Z90259-based products. The Z90259 Emulator and ZiLOG Developer Studio (ZDS) software runs under Microsoft Windows® 95, 98, and NT platforms, supporting selected Z90200-family devices.

NOTE: Windows is a registered trademark of the Microsoft Corporation.

SUPPORTED DEVICES

Programming	Emulation
Z90231	Z90233, Z90234
Z90241	Z90243, Z90244
Z90251	Z90255

NOTE: The specific list of supported devices is specified in the ZiLOG Data Sheet (DS) document shipped with ZiLOG's Order Acknowledgment form.

HARDWARE SPECIFICATIONS

Operating Conditions

Operating Temperature: 20°C ±10°C

Emulation Speed: 3-MHz Internal SCLK (Maximum) or 6-MHz External SCLK (Maximum)

Operating Humidity: 10-90% RH (Noncondensing)

Power Requirements

+4.75 VDC to +5.25 VDC (+5.0 VDC @ 1.0A Typical, 1.5A Maximum)

Dimensions: 2.5 In. Height X 6.25 In. Width X 9.5 In. Depth

Serial Interface

RS-232C @ 9600, 19200 (Default), 28800, or 57600 Baud

Emulation Memory

Z8 ROM = 32 KB Maximum, OTP = 32 KB, ROM-Masked Parts = 16 KB, 24 KB, or 32 KB.

CGROM = 32 KB Maximum

Hardware Breakpoints

Z8 = 256 Maximum

HOST COMPUTER SYSTEM

Minimum Requirements

IBM PC or 100-Percent Compatible Pentium-Based Machine

75 MHz

16-MB RAM

SVGA Video Adapter

Hard Disk Drive (12.0-MB Free Space)

CD-ROM Drive

RS-232C COM Port

Mouse or Pointing Device

Microsoft Windows 95

Recommended

The following changes to the Minimum Requirements are recommended for increased performance:

Pentium-Based Machine

166 MHz (or Faster)

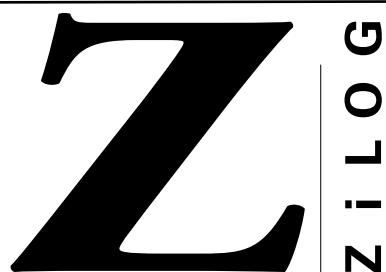
32-MB RAM (or More)

ADDITIONAL REQUIRED ITEMS NOT SUPPLIED WITH THE SUPPORT PACKAGE

- A source of power (+4.75 VDC to +5.25 VDC Max [+5.0 VDC typical]) for the emulator. It can be a laboratory power supply with supply current of 0.75A or more.
- Your Target Design

OPTIONAL ITEMS NOT SUPPLIED WITH THIS PACKAGE

- Z9024300ZAC 42-SDIP Accessory Kit. Emulation Pod and OTP Adapter for Z90241/243/244.



Totally Logical

CHAPTER 2

SETUP AND INSTALLATION

INSTALLING THE SOFTWARE

Software for the Z90259 emulator is ZiLOG Developer Studio (ZDS). It includes the ZiLOG Macro Cross Assembler (ZMASM). The software is provided on a CD.

ZDS Installation

The ZiLOG Developer Studio (ZDS) is the 32-bit development environment which runs under windows 95, 98, and NT.

To install ZDS, perform the following steps:

1. Place the CD in the CD-ROM, and press *Enter*. The Destination dialog box prompts for the directory into which to install the software.
2. Enter the directory path. The setup program copies the files into the target directory.
3. Follow the on-screen instructions.
4. Remove the CD, and store it in a safe place.

ZDS Uninstallation

Uninstaller facilities are created during the installation of ZDS. An entry is created in the submenu under Programs.

Installing the Hardware

Before installing the hardware, refer to Figure 2-1 for a rear view of the generic emulator. Figure 2-2 provides a diagram for connecting an ICEBOX emulator to your PC and power supply.

NOTE: Proper functioning of the emulator depends upon proper installation and running ZDS on your PC.

Quick Installation

This section provides you with a quick overview of the steps involved in setting up the hardware. The Complete Hardware Installation section, which immediately follows, provides a more detailed description of the hardware setup procedure.

1. Turn the power supply on (before connecting to the ICEBOX), adjust to +5.0V, and set to at least 1.5A.
2. Connect the serial cable to the PC.
3. Connect the ICEBOX emulator to your design.
4. Set up the oscillator and option jumpers.
5. Refer to the Electrical Safeguards shown on the inside cover of this manual.
6. Turn the power supply OFF before connecting to the emulator.
7. Connect the power cable to the ICEBOX.
8. Power up the ICEBOX emulator by turning the power supply ON.

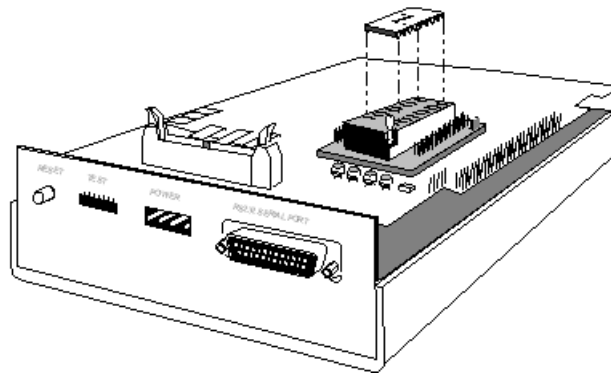


Figure 2-1. Generic ICEBOX (Rear View)

Complete Hardware Installation

Connecting to a Power Supply

WARNING!

Always check the supply voltage before plugging the power cord.

If your power supply allows voltage adjustment, do the following:

1. Turn the power supply on and adjust it to +5V.
2. Set it for at least 1 . 5A, if there is a current-limiting adjustment.
3. Turn the supply OFF or ensure that a nonadjustable supply is OFF.
4. Locate the power cable (red wire, black wire, and banana plugs on the other end). Plug in the black banana plug into the black jack on the power supply (labeled COM, GND, or with the ground symbol). Plug in the red plug into the red jack on the power supply (labeled +, +V or +5V).
5. Plug the white connector on the other end of the cable into the matching 4-pin connector on the back side of the ICEBOX emulator. This connection is keyed to ensure against an improper connection.

The ZiLOG Power Supply Accessory Kit (ZPS05V00ZAC), which is sold separately, provides a fixed-5V universal output power supply, accepts 110V to 220V AC input, and includes a power cable and an in-line jack cable.

Connecting the Serial Cable to the PC

Locate the serial cable. Connect the male end to the female connector on the back of the ICEBOX, and the female end to either the COM1, COM2, COM3, or COM4 connector of your PC.

NOTE: If connector availability is limited to a 9-pin COM1 through COM4, you must use either a different cable or a 25-pin to 9-pin converter. (ZiLOG does not provide either of these items.)

Connecting to Your Design

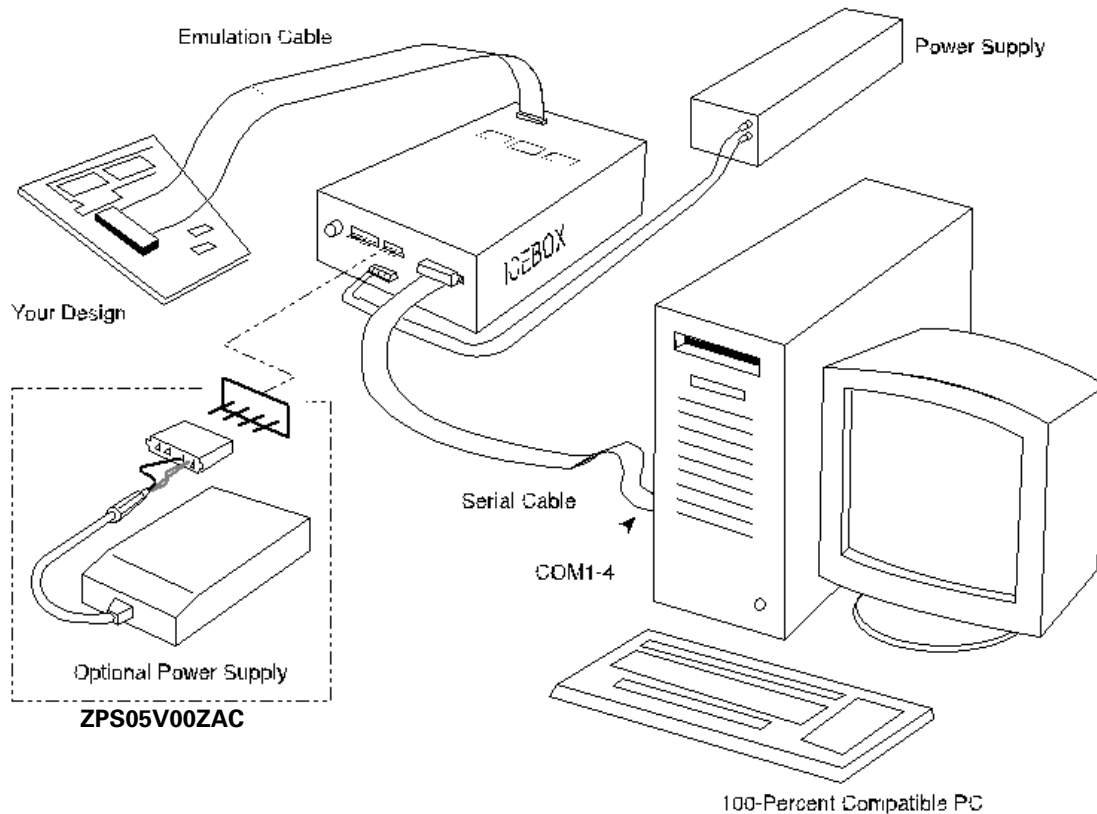


Figure 2-2. Hook-Up Diagram (Rear View of Emulator)

Locate the emulation cable for the device you have designed in.

NOTE: Wear a properly grounded wrist strap or similar ESD protection before continuing.

Plug one end of the ICEBOX cable into your target device, being very careful to orient the pin 1 marking (as indicated by the red mark on the ribbon cable) to match the pin 1 on your target board. Plug the other end of the cable into the matching blue connector on top of the ICEBOX emulator.

ZiLOG

Connecting a Logic Analyzer (Optional)

The logic analyzer can be connected as part of initial setup (or later as you continue working with your design).

For Use

Z8 P7 Connector

Some ICEBOX emulators include several gray connectors or a 100-pin connector on top for easy connection to logic analyzers. (For example, the Hewlett-Packard 16500 Family has 16 signals and a clock and ground per pod (channel). An ICEBOX emulator with a 100-pin connector requires a HP analyzer interface board (ZiLOG P/N Z89C0000ZHP).

Emulator Jumper Locations

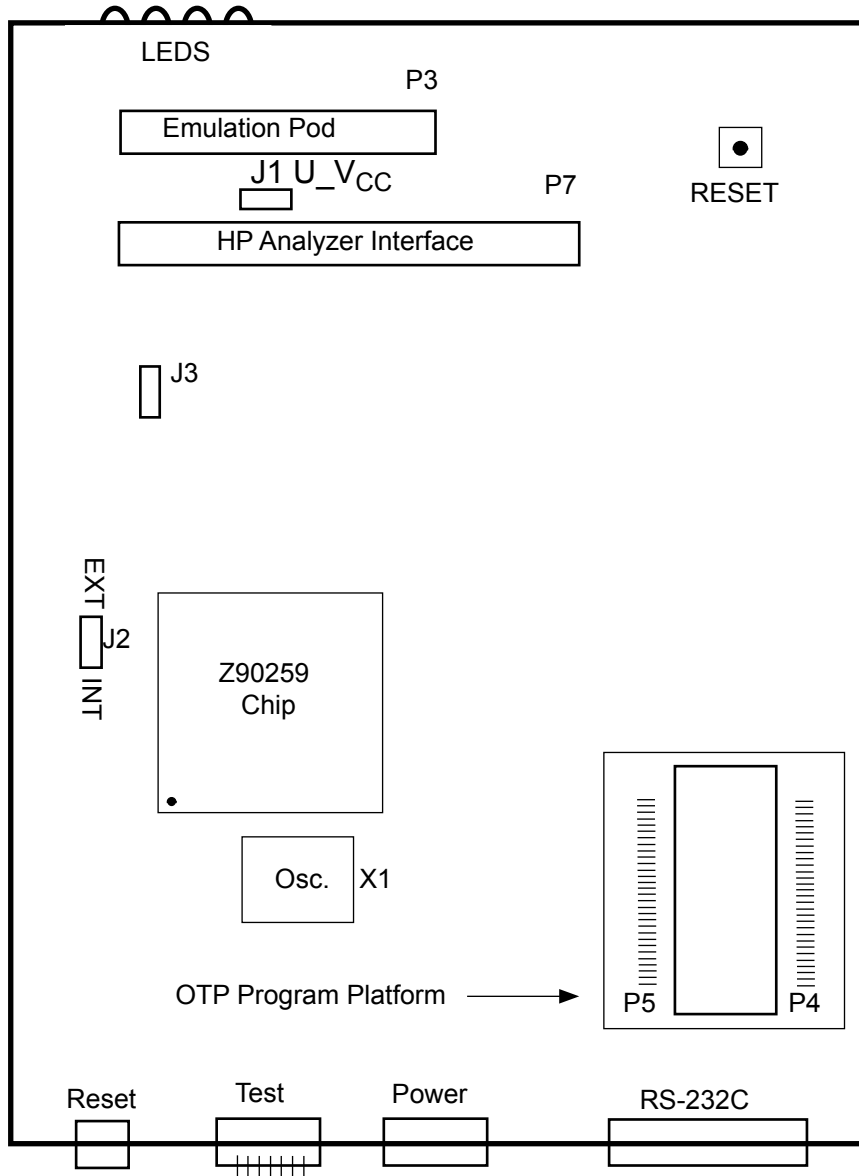


Figure 2-3. Jumper Locations

Table 2-1. Jumper Option Settings

Jumper	Position	Description
J1	1-2 2-3	Emulator supplies power to target system through the V_{CC} pin. Emulator power is isolated from the target system.
J2	1-2* 2-3	Use the ICEBOX Emulator's Z8ROM and CGROM Memory. Use the ICE chip's internal Z8ROM and CGROM Memory.
J3	1-2* 2-3	Buffered/Schmitt-triggered H_{SYNC} signal. Unbuffered H_{SYNC} signal.
Note: The * indicates the default setting.		

POWERING UP/POWERING DOWN PROCEDURES

WARNING!

If your design already has a power supply, do *not* power your design from the ICEBOX emulator V_{CC} pin.

Powering Up

If anything unusual (such as unexpected sounds and smells) occurs when you turn on the power supply, quickly turn off the power supply and check your connections. If your power supply allows voltage adjustment, adjust it again to +5V. (It may be somewhat lower than +5V because of the load of the ICEBOX emulator.) If your power supply has a current meter, ensure that the ICEBOX emulator is drawing within the rated current.

After power-up, press the RESET button to reset the ICE chip. (Pressing the RESET button avoids bus contention on the I/O lines.) If the ICEBOX emulator is not powering your design through the V_{CC} pin, turn on the power supply of the design.

Powering Down

When powering down, follow the procedure described below:

1. Power down the target application board (if using its own power supply).
2. Power down the ICEBOX emulator.

Refer to the complete "Electrical Safeguards" shown on the inside cover of this manual.

EMULATOR OPERATION

Resetting

Pressing the RESET button on the ICEBOX emulator resets the state of the target device and much of the status that you establish using ZDS. For example, it clears all Z8 Breakpoints. If your application board drives the RESET pin of the Z8 socket LOW, the target Z8 is reset. For example, it sets the Z8 Program Counter to %000C, but does not affect most of the other ZDS and ICEBOX emulator status.

NOTE: After reset, you must wait until LED A is ON and has finished blinking before starting ZDS. Refer to the “LED Operation” section later in this chapter.

You must always press the RESET button on the ICEBOX emulator before selecting the ZDS icon.

Breakpoint Implementation.

The ICEBOX emulator bases its breakpoint facility completely on addresses, rather than on inserting special TRAP instructions into the program, which means you can set breakpoints in ROM on your target board. The ICEBOX emulator uses a static RAM for each cycle emitted by the ICE chip during code execution to implement the breakpoint function in hardware.

LED Operation

Table 2-2. Front LED Assignments

LED	Indication	Description
A	On Off Blink	Emulator is powered up and Self Test is completed Power is OFF Emulator is self-testing
B	On Off	Communicating in BISYNC mode and waiting for command Communicating in ASCII mode or executing BISYNC command
C	On Off	Running Z8 user code Not running Z8 user code
D	On Off	Running OTP operations Not running OTP operations

ZDS

The Z90259 emulator is fully compatible with ZiLOG Developer Studio (ZDS) software. The following steps briefly describe the procedures necessary to set up and create your project. A summary of the emulator's DEBUG windows is included at the end of this chapter.

For more detailed information, refer to the ZDS User's Manual located on the installation CD-ROM, or download the latest information from the web site, www.zilog.com.

Creating A New Project

To create a new project perform the following steps:

1. Click on **Start**, then **Programs**, and **ZiLOG Developer Studio 2.00**, and **ZDS 2.00**. ZDS opens.
2. Click on **File**, then **New Project**. The New Project dialog box is presented.

If the project has already been created, select **Project**, then **Target**, to see the ZiLOG MCU Database dialog box.

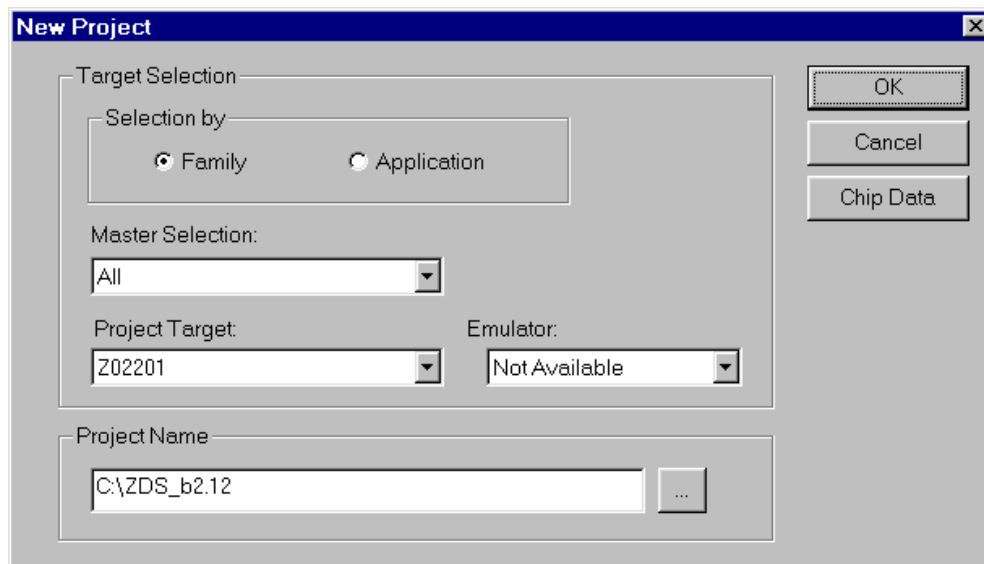


Figure 2-4. New Project Dialog Box (Default Values)

3. In the Selection by field, select **Family**.
4. In the Project Target field, select **Z90255**. Z90259 becomes the value in the Emulator field.

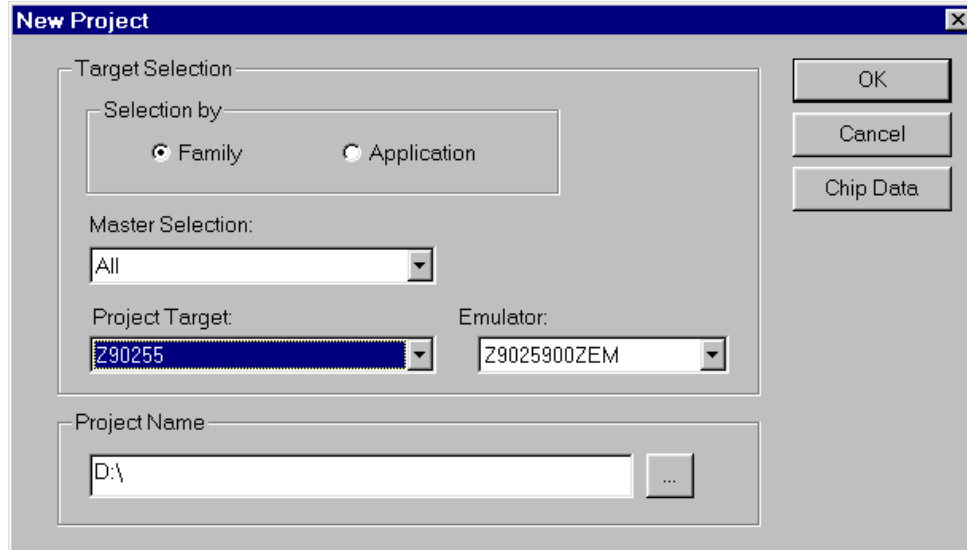


Figure 2-5. New Project Dialog Box (Z90255 Values)

5. In the Project Name field, click on the browse button [...]. The New Project Browse dialog box appears.

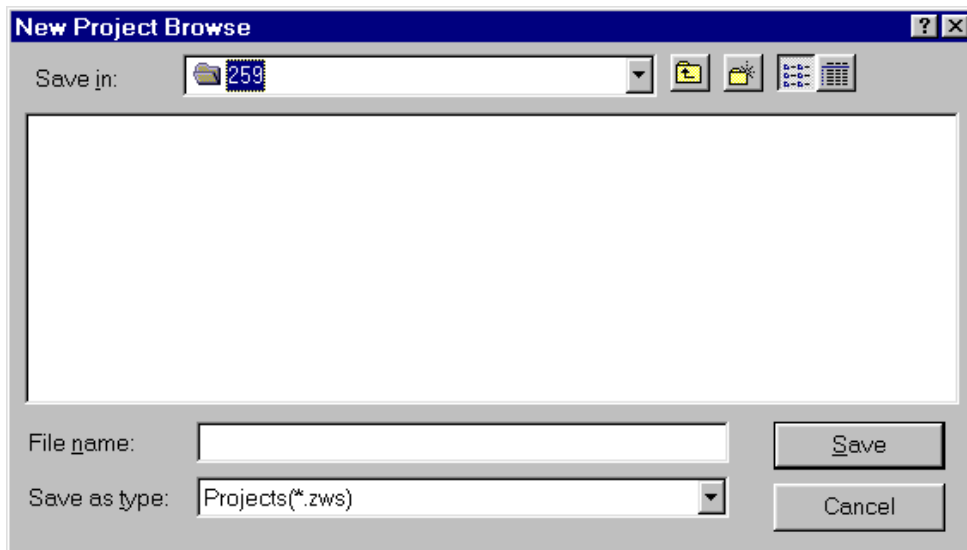


Figure 2-6. New Project Browse Dialog Box

6. In the New Project Browse dialog box, type the project file name (for example, sample1), and select a path.

All build output files, such as linker and assembly files, are saved in the same directory as the project.

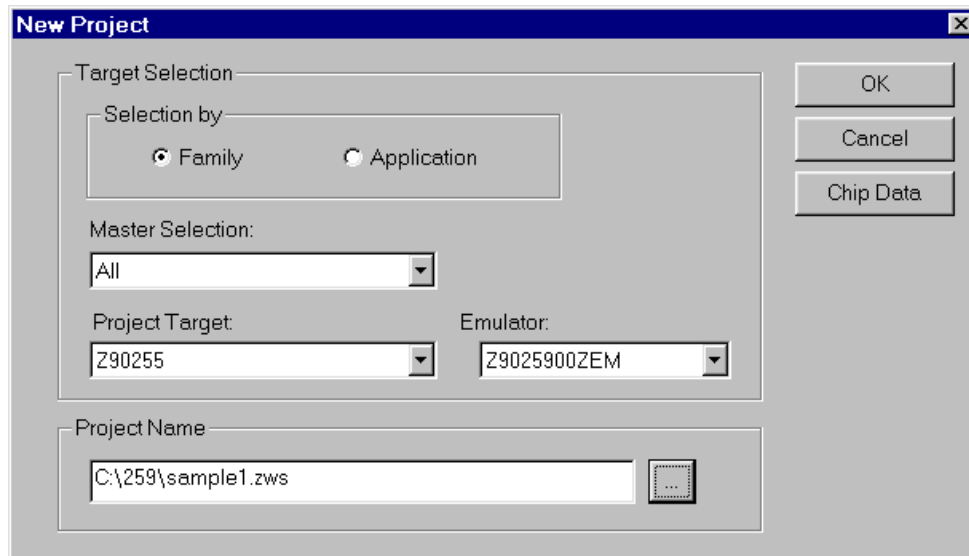


Figure 2-7. New Project Browse Dialog Box (Z90255 Values)

7. Click on Save. The project name is displayed in the Project Name field of the New Project dialog box.
8. Click on the `Chip Data` button to view the Z90255 specification.

Fields in the Chip Data window are read-only and cannot be modified.

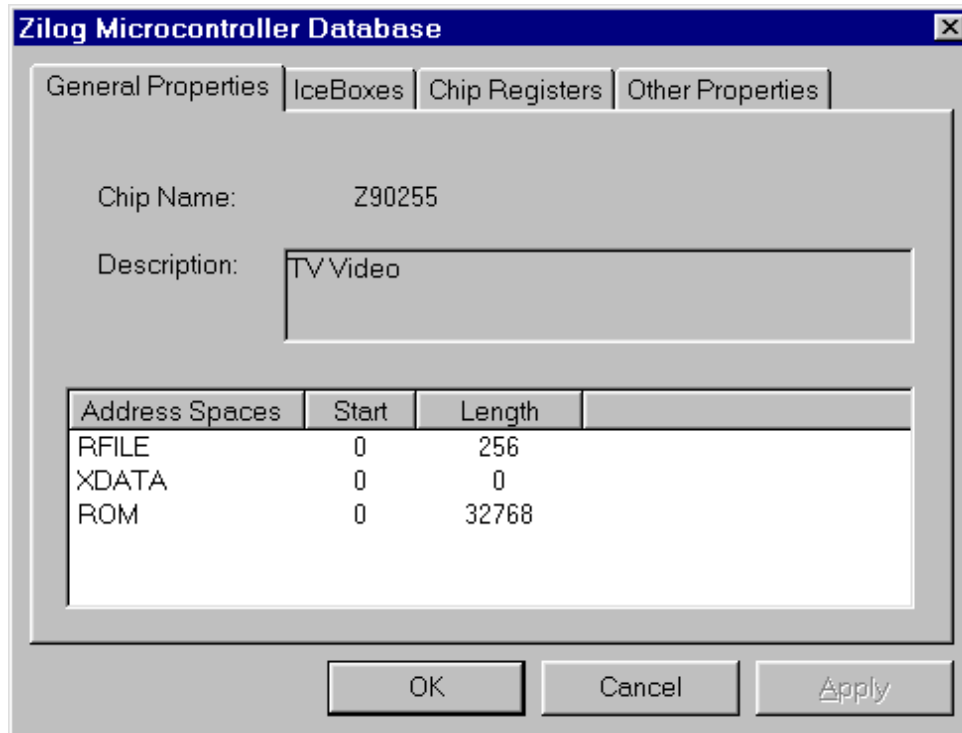


Figure 2-8. ZiLOG Microcontroller Database Window

9. Click on OK. The new project is saved as the name specified in the New Project Browse dialog box. The New Project window is no longer displayed.
10. Click on Project, then Emulator Configuration. The Emulator Configuration dialog box appears.

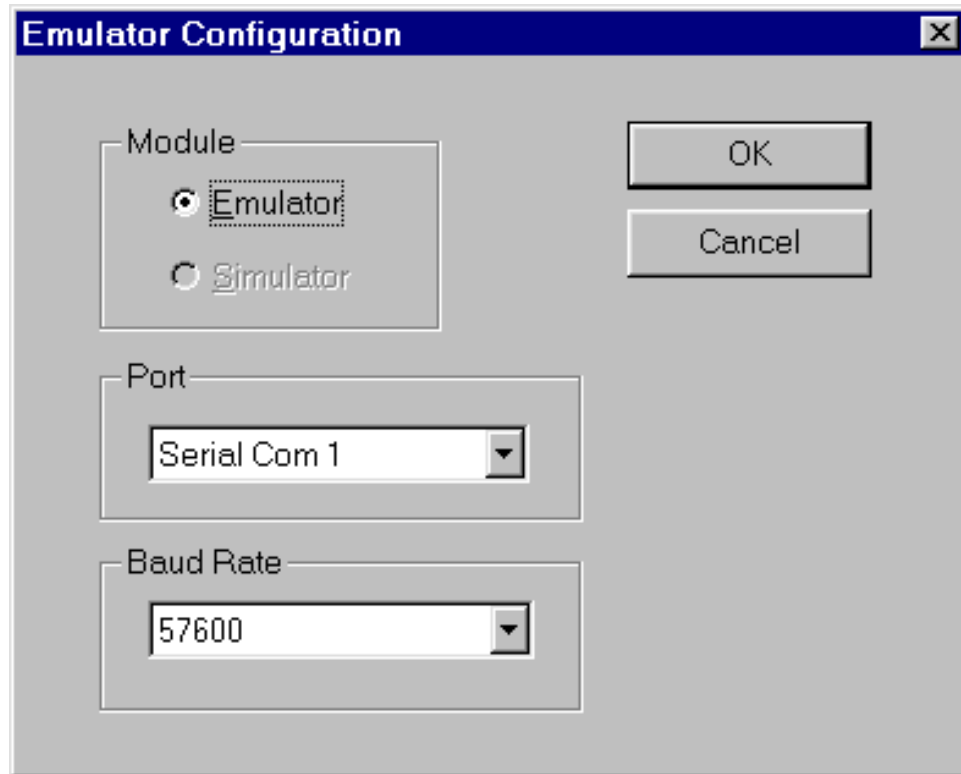


Figure 2-9. Emulator Configuration Dialog Box

11. Ensure that `Emulator` is selected in the Module field.
12. Select the appropriate port from the Port pull-down list.
13. Select the appropriate baud rate from the Baud Rate pull-down list.
14. Click on `OK`. The Emulator Configuration dialog box is no longer displayed.
15. Click on `File`, then `Save Project`. The emulator configuration settings are saved.

Opening A Project and Adding Files

A previously created project has the following attributes saved with it:

- Target settings
- Assembler and Linker settings for the specified target
- Source files (including header files)

Use the Project Viewer window to view and access the various files in any given project.

To open an existing project, perform the following steps:

1. Click on **File**, then Select **Open Project**. The Open Project dialog box is displayed.

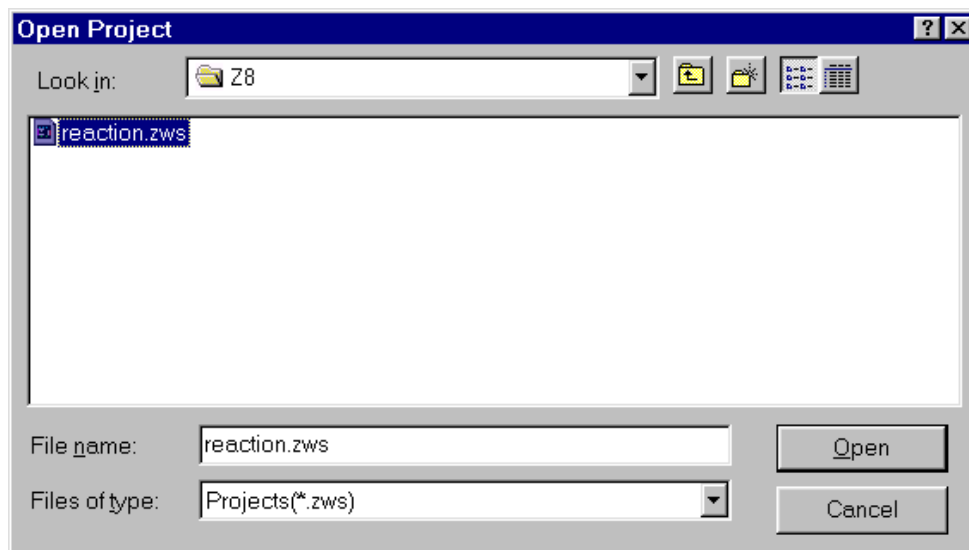


Figure 2-10. Open Project Dialog Box (Sample File)

2. In the Open Project dialog box, select the project name, then click on **Open**. The project is displayed in the Project Workspace window.

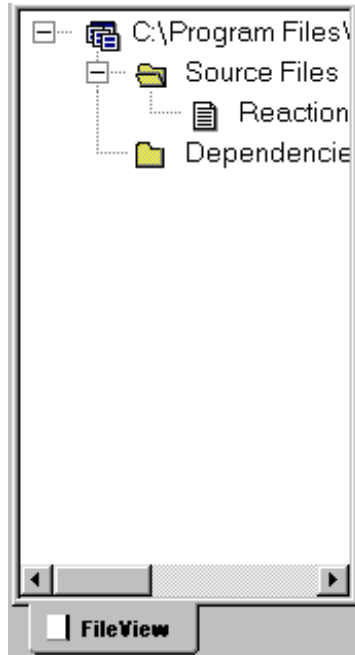


Figure 2-11. Project Workspace Window

Adding An Existing File

To add an existing file to a project, perform the following steps:

3. Click on **Project**, then **Files**, and **Add to Project**. The **Insert Files into Project** dialog box appears.

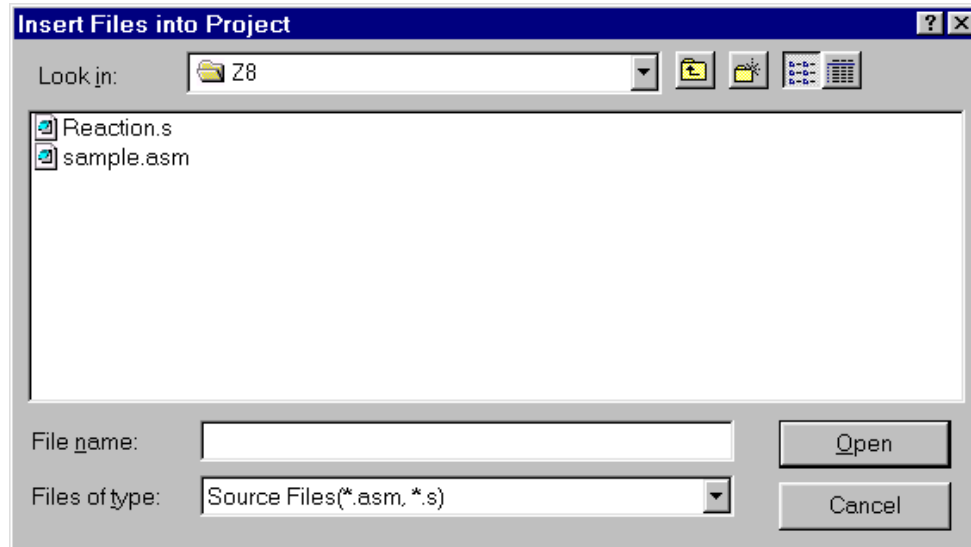
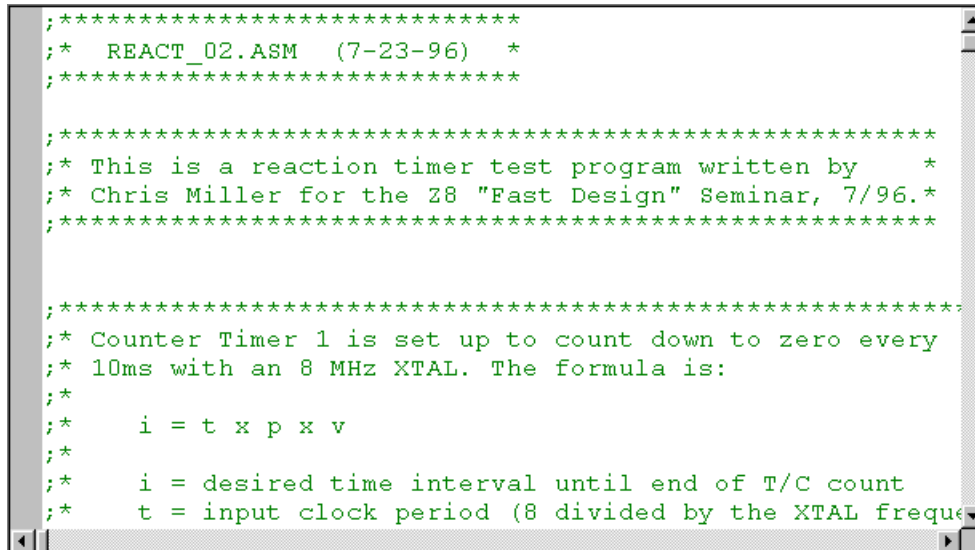


Figure 2-12. Insert Files into Project Dialog Box

4. Select the file to add to the project.
5. Click Open. The file appears in the Project Workspace window (see Figure 2-11).
6. Double-click on the `reaction.s` file in the Project Viewer window. The file appears in the ZDS main Edit window.

In some cases, non-editable files, such as `.obj` files need to be included in a project. These files are displayed in the source file list, but cannot be opened. When the project is built, these files are automatically linked.



```
*****  
;* REACT_02.ASM (7-23-96) *  
*****  
  
*****  
;* This is a reaction timer test program written by *  
;* Chris Miller for the Z8 "Fast Design" Seminar, 7/96.*  
*****  
  
*****  
;* Counter Timer 1 is set up to count down to zero every  
;* 10ms with an 8 MHz XTAL. The formula is:  
;*  
;* i = t x p x v  
;*  
;* i = desired time interval until end of T/C count  
;* t = input clock period (8 divided by the XTAL frequ
```

Figure 2-13. Source File

7. Click on Build, then Select Update All Dependencies. The Dependencies folder list in the Project Workspace window is updated.

**Figure 2-14. Output Window**

Adding A New File

1. Click on Project, then New, and Select Add to Project. The Insert New Files Into Project dialog box appears (see Figure 2-12).
2. Type a file name in the File Name field.
3. Click Open. The new file name appears in the Project Viewer window with an .asm suffix, and a blank Edit window also appears.

Header and Included files do not have to be added. The program detects those called by the source code.

AVAILABLE DEBUG WINDOWS

The following table list the debug window that are available using ZDS.

TABLE 2-15. DEBUG WINDOWS

Window	Function
Watch [Alt+3]	Displays the symbols and the contents of the registers (see the ZDS User's Manual for more information).
Z8 Standard Registers	Displays the contents of registers for the Z8 core.
Code Memory	Enables the user to monitor, edit, and download a <code>file.ld</code> or <code>file.hex</code> into the Code Memory from generated assembly source code. Also, tracks a specific address entered in the Code Address edit box.
Disassembly	<p>Performs several functions:</p> <ul style="list-style-type: none"> - Displays code memory along with the corresponding disassembled code. - Enables the user to edit and download a <code>file.ld</code> or <code>file.hex</code> into the Code memory. - Follows the program counter. - Provides a complete scroll down with this window; however the scroll up is limited. - Accesses the disassembly of code at the address specified in the Code Address field. <p>The Disassembly window is automatically displayed when debugging hex code or whenever there is no corresponding source file available at the address specified by the program counter.</p>
Z8 Register File	Displays data in the first 128 registers. Enables the user to monitor all registers and edit the read-write registers.
Z8 Expanded Register	The first line displays the registers in the active expanded register bank.
Character Generator	Enables the user to monitor and edit the contents of Z8 Character-Generator Memory.
Working Registers (R0-R15)	Displays the current values in registers R0-R15.
Timer/Counter Registers	Displays the current values in the timer/counter registers.
Ports Registers	Displays the current values in the ports registers.



CHAPTER 3

TROUBLESHOOTING GUIDE

INTRODUCTION

Before contacting your ZiLOG representative or submitting a Problem Report, please follow these simple steps. Also, check the Precautions and Limitations sections in the Product Information document included with your emulator to eliminate other possible known problems. If a hardware failure is suspected, contact your local ZiLOG representative for assistance.

ZDS ERROR OPENING SERIAL PORT

1. Check RS-232C cable connection and Communication Port Selection in the ZDS Project Emulator configuration, or try another, known good cable.
2. Check if transmit/receive signals need to be swapped.

NOTE: On some DB9 connectors for the COM ports, the transmit/receive signal may be swapped and a Null Modem adapter may be required.

3. Ensure that the power supply is connected, is turned on, and power is available.
4. Ensure that the power supply is set at the correct voltage.
5. Ensure that the correct crystal oscillator, X1 on the Mother board, is 7.3728 MHz.
6. Check if power supply is supplying the required current (0.5A typical, 0.75A maximum) to the emulator.
7. Check selected port using another application or select another COM port.
8. After resetting the emulator, wait a minimum of 5 seconds before running the ZDS software.

V_{CC} CONTENTION

To avoid V_{CC} contention when a separate V_{CC} is supplied to target, ensure that jumper J1 position 1-2 of the Z90259 emulation board is not connected.

“OUT OF SYNCHRONIZATION WITH THE EMULATOR” MESSAGE

This message appears whenever communication between the emulator and the PC is interrupted.

1. Ensure that the power cable is connected.
2. Ensure that the RS-232C cable is connected.
3. Change the baud rate setting (default is 19200). A lower setting usually improves communications reliability.
4. The Emulator hardware RESET button was pressed while the emulator was running.

PROGRAM COUNTER JUMPS TO UNEXPECTED ADDRESS

Any instruction other than a DI instruction is used to disable interrupts. Possible causes include:

- The stack overflows into the general register locations.
- Extra POP, PUSH, IRET, or RET is encountered (stack unbalanced).
- Program resets repeatedly. The Program Counter rolls over from value FFFF to 0000 and proceeds back to the beginning of program.
- Uninitialized interrupt vector is activated. The interrupt vector is not set to the interrupt handler.



CHAPTER A

Totally Logical

ZILOG ON THE WEB

ZILOG'S WEB SITE

The home page address of the ZiLOG web site is:

<http://www.zilog.com>

The site includes valuable information about hardware and software development tools and documentation. The latest production-released version of the ZiLOG Developer Studio (ZDS) can be downloaded from this site. The types of documentation that are available from the web site include:

- Product Briefs
- Product Specifications
- User Manuals
- Data Books
- Application Notes
- White Papers

Documentation may be downloaded or printed from the site.

PRE-PRINTED DOCUMENTATION

Print-on-demand hardcopy documentation may be obtained from Fatbrain.com. The costs for the documentation vary but generally range between \$15 and \$45. Shipment to customers is expected to occur within 2-3 days of receipt of the order. ZiLOG's on-line library is listed under the programming, documentation, microprocessor, and microcontroller sections of the Fatbrain.com web site.



Totally Logical

APPENDIX B

ASCII CHARACTER SET

ASCII CHARACTER SET

Table B-1. ASCII Character Set

Graphic	Decimal	Hexidecimal	Comments
	0	0	Null
	1	1	Start Of Heading
	2	2	Start Of Text
	3	3	End Of Text
	4	4	End Or Transmission
	5	5	Enquiry
	6	6	Acknowledge
	7	7	Bell
	8	8	Backspace
	9	9	Horizontal Tabulation
	10	A	Line Feed
	11	B	Vertical Tabulation
	12	C	Form Feed
	13	D	Carriage Return
	14	E	Shift Out
	15	F	Shift In
	16	10	Data Link Escape
	17	11	Device Control 1
	18	12	Device Control 2
	19	13	Device Control 3
	20	14	Device Control 4
	21	15	Negative Acknowledge
	22	16	Synchronous Idle

Table B-1. ASCII Character Set (Continued)

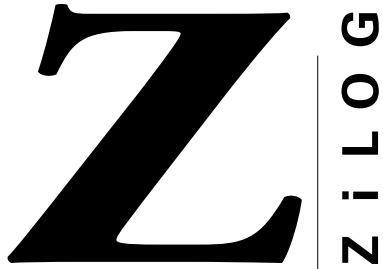
Graphic	Decimal	Hexidecimal	Comments
	23	17	End Of Block
	24	18	Cancel
	25	19	End Of Medium
	26	1A	Substitute
	27	1B	Escape
	28	1C	File Separator
	29	1D	Group Separator
	30	1E	Record Separator
	31	1F	Unit Separator
	32	20	Space
!	33	21	Exclamation Point
"	34	22	Quotation Mark
#	35	23	Number Sign
\$	36	24	Dollar Sign
%	37	25	Percent Sign
&	38	26	Ampersand
'	39	27	Apostrophe
(40	28	Opening (Left) Parenthesis
)	41	29	Closing (Right) Parenthesis
*	42	2A	Asterisk
+	43	2B	Plus
,	44	2C	Comma
-	45	2D	Hyphen (Minus)
.	46	2E	Period
/	47	2F	Slant
0	48	30	Zero
1	49	31	One
2	50	32	Two
3	51	33	Three
4	52	34	Four
5	53	35	Five
6	54	36	Six
7	55	37	Seven
8	56	38	Eight
9	57	39	Nine

Table B-1. ASCII Character Set (Continued)

Graphic	Decimal	Hexidecimal	Comments
:	58	3A	Colon
;	59	3B	Semicolon
<	60	3C	Less Than
=	61	3D	Equals
>	62	3E	Greater Than
?	63	3F	Question Mark
@	64	40	Commercial At
A	65	41	Uppercase A
B	66	42	Uppercase B
C	67	43	Uppercase C
D	68	44	Uppercase D
E	69	45	Uppercase E
F	70	46	Uppercase F
G	71	47	Uppercase G
H	72	48	Uppercase H
I	73	49	Uppercase I
J	74	4A	Uppercase J
K	75	4B	Uppercase K
L	76	4C	Uppercase L
M	77	4D	Uppercase M
N	78	4E	Uppercase N
0	79	4F	Uppercase 0
P	80	50	Uppercase P
Q	81	51	Uppercase Q
R	82	52	Uppercase R
S	83	53	Uppercase S
T	84	54	Uppercase T
U	85	55	Uppercase U
V	86	56	Uppercase V
W	87	57	Uppercase W
X	88	58	Uppercase X
Y	89	59	Uppercase Y
Z	90	5A	Uppercase Z
[91	5B	Opening (Left) Bracket
\	92	5C	Reverse Slant

Table B-1. ASCII Character Set (Continued)

Graphic	Decimal	Hexidecimal	Comments
]	93	5D	Closing (Right) Bracket
^	94	5E	Circumflex
_	95	5F	Underscore
`	96	60	Grave Accent
a	97	61	Lowercase A
b	98	62	Lowercase B
c	99	63	Lowercase C
d	100	64	Lowercase D
e	101	65	Lowercase E
f	102	66	Lowercase F
g	103	67	Lowercase G
h	104	68	Lowercase H
i	105	69	Lowercase I
j	106	6A	Lowercase J
k	107	6B	Lowercase K
l	108	6C	Lowercase L
m	109	6D	Lowercase M
n	110	6E	Lowercase N
o	111	6F	Lowercase O
p	112	70	Lowercase P
q	113	71	Lowercase Q
r	114	72	Lowercase R
s	115	73	Lowercase S
t	116	74	Lowercase T
u	117	75	Lowercase U
v	118	76	Lowercase V
w	119	77	Lowercase W
x	120	78	Lowercase X
y	121	79	Lowercase Y
z	122	7A	Lowercase Z
{	123	7B	Opening (Left) Brace
	124	7C	Vertical Line
}	125	7D	Closing (Right) Brace
~	126	7E	Tilde
	127	7F	Delete



Totally Logical

PROBLEM/SUGGESTION REPORT FORM

If you experience any problems while operating this product, or if you note any inaccuracies while reading the User's Manual, please copy this form,

fill it out, then mail or fax it to ZiLOG (see "Return Information"). We also welcome your suggestions!

Customer Information

Name	_____	Country	_____
Company	_____	Telephone	_____
Address	_____	Fax Number	_____
City/State/ZIP	_____	E-Mail Address	_____

Product Information

Serial # or Board Fab #/Rev. #
Software Version
Manual Number
Host Computer Description/Type

Return Information

ZiLOG, Inc.
System Test/Customer Support
910 E. Hamilton Ave., Suite 110, MS 4-3
Campbell, CA 95008
Fax Number: (408) 558-8536
Email: tools@zilog.com

Problem Description or Suggestion

Provide a complete description of the problem or your suggestion. If you are reporting a specific problem, include all steps leading up to the occurrence of the problem. Attach additional pages as necessary.
