



*Totally Logical*

# Z8932312ZEM

## DSP FAMILY EMULATOR—Z89323

### FEATURES

#### Supported Devices

Packages	Emulation	OTP Programming
44-pin PLCC	Z89223/273 <sup>1</sup>	Z89273 <sup>1</sup>
44-pin QFP	N/A	N/A
68-pin PLCC	Z89323/373	Z89373
80-pin QFP	N/A	Z89373

**Notes:**

1. Requires an optional, separately-purchased accessory kit (Z8922300ZAC) from ZiLOG.

- ICEBox Emulator Provides Source-Level Debugging for DSP Codes

- HP Logic Analyzer Interface
- 64K of External Data Memory
- Symbolic Disassembly in the Debug Window
- Selectable Baud Rates—9600 to 57.6 Kbps
- Windows-Based User Interface
- RS-232C Connector
- ZiLOG Macro Cross Assembler (ZMASM)
  - Structured Assembly and Data Code
  - Source-Level Debug Support
  - Built-In Register Equates
  - Linker

### GENERAL DESCRIPTION

ZiLOG's in-circuit emulators are interactive Windows-oriented development tools that provide a real-time environment for developing and debugging software. Included with each of ZiLOG's emulators is a powerful, full-featured macro cross assembler. When used in conjunction with the Z89323 Emulator, this tool is designed to enhance programmer productivity.

The Emulator provides a hardware platform that is a significant improvement compared to software simulators. The

Emulator is faster in operation than simulators, making it more practical for code development.

The Z89323 Emulator, which supports the Z89323 family of DSP processors listed above, provides essential timing and I/O circuitry to simplify user emulation of the prototype hardware and software product.

The Z89323 Emulator can be connected to the serial port (COM1, COM2, COM3, or COM4) of the host computer, and uses Graphical User Interface (GUI) software.

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## SPECIFICATIONS

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### Operating Conditions

Operating Temperature:	20°C, ±10°C
Supply Voltage:	+5 VDC ±5% or 9.0 VDC @ 1.2 A wall adapter
Operating Humidity:	10%–90% RH (noncondensing)
Minimum Emulation Speed:	1 MHz
Maximum Emulation Speed:	20 MHz

### Power Requirements

The emulator board has dual-power capability: 9.0 VDC or 5.0 VDC. If optional OTP programming is enabled and the 5.0 VDC terminal is used, a 6.0 VDC ±5% @ 500 mA (typical) power source is also required.

### Dimensions

Width:	8.00 in. (20.320 cm)
Length:	9.75 in. (24.765 cm)
Height:	0.50 in. (1.270 cm)

### Serial Interface

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

### Emulation Memory

DSP = 64K Words (maximum)

### Number of Breakpoints

DSP = 256 (maximum)

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## HOST COMPUTER

### Minimum Requirements

IBM PC (or 100-percent compatible) 486-based machine

- 33 MHz
- 4 MB RAM
- VGA Video Adapter
- CD-ROM Drive
- RS-232 COM Port
- Mouse or Pointing Device
- Microsoft Windows 3.1 (utilized with DSPICE software)

### Recommended

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

- Pentium-Based Machine
- 66 MHz (or faster)
- 8 MB of RAM (or more)
- SVGA Video Adapter
- Color Monitor
- Printer
- Microsoft Windows 95

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**KIT CONTENTS**

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**Quantity Item**

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1	Z8932312ZEM Emulator Board
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**Cables/Pods**

1	RS-232 Serial Cable, 9-pin M-F
1	Emulation Pod, 68-pin PLCC
1	Power Cable Assembly, 4-Leads
1	Programming Adapter, 68-pin PLCC
1	Programming Adapter, 80-pin QFP

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**Host Software**

1	CD-ROM Development Software
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**Documentation**

1	Z8932302ZEM Emulator User's Manual
1	ZiLOG Macro Cross Assembler User's Manual
1	Software License and Limited Warranty Agreement

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**ADDITIONAL REQUIRED ITEMS NOT SUPPLIED**

- A Target Design  
Typically, a design will be a wire-wrapped or printed-circuit prototype that includes a 68-PLCC socket which connects to the emulator's pod.
- ZiLOG's HP Logic Analyzer Interface Board

## PRECAUTIONS

1. GUI software versions prior to 3.00 are incompatible with hardware containing BOOTROM 3.00. The GUI software may still boot; however, the software could fail at some later point.
  2. When simultaneously running two different GUI versions on two different Communication Ports, the former executed version is used for both emulators. These are typical Windows O/S bugs.
  3. The emulator cannot be operated while performing ESD/EMI testing on the target board.
  4. The GUI occasionally indicates Executing after a HALT instruction. Pushing the GO button also indicates Executing. (Executing displays at the caption bar of the Debug window.)
  5. Ensure that the target cable is correctly aligned (pin-1 to pin-1) before inserting into the target system. Incorrect alignment may damage the emulator and/or the target system.
  6. Do not start the emulator with an OTP device in the programming socket. This action may cause the emulator to not start up correctly.
  7. A shorted PLCC or DIP OTP can crash the emulator when inserted into the OTP programming socket. If a PLCC part is inserted in such a way as to cause a temporary short, then functionality is lost. An attempt to perform BLANK CHECK on such a part causes the "hourglass" to run incessantly. The Windows application must be reset and restarted.
  8. The status color bar in the OTP dialog box clears when a new window opens on top of it.
  9. Do not press the emulator MASTER RESET when the emulator is in the OTP dialog for programming. If MASTER RESET is pressed while the GUI is doing OTP programming, close the OTP dialog box and re-open it to reload the information back to the hardware.
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- Note:** The emulator is really sitting idle, although the Command Status shows "Processing" after the GUI reestablishes the communication link when "Retry" was selected in the "Out of Synchronization with the Emulator" dialog box.
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10. When device serialization is enabled in the OTP dialog, the GUI copies the current serial number to code memory immediately before performing a VERIFY operation. If this behavior is undesirable, then device serialization should be disabled prior to invoking the VERIFY operation.
  11. Do not use the OTP operation while in the Debug's trace and/or animation mode.
  12. Option selections for the OTP are not cleared after changing a Device selection (applies to DSPICE GUI).
  13. The Edit|Fill|Memory Decimal radix option will not accept entry of more than 9,999 for the Fill Value. Please use the Hexadecimal radix option when using a fill value of more than 9,999 decimal.

## LIMITATIONS

1. Switching Emulators without quitting the GUI is not supported and may cause unexpected results.
2. The Emulator breakpoint hardware does not distinguish between instruction and data fetches. Consequently, the breakpoint hardware triggers when the address specified matches either an instruction or data fetch.
3. ROM PROTECT option programming is temporarily disabled.
4. The maximum loadable symbols is 32,768, provided there is enough system resource (memory).
5. Although GUI 3.00 and later support baud rates up to 57.6K baud, the actual maximum usable rate may be less due to limitations of the users hardware and/or system software setup. The maximum usable rate is determined by the users tolerance of the frequency of communication errors.
6. The GUI does not recognize the PUSH and POP instructions when entered in the In-Line Assembler (Debug window). As a workaround, use LD STACK,xxx for PUSH and LD xxx,STACK for POP.
7. Please consult the P\_ANDL.TXT and OTPPROG.TXT files for the latest updates.

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### Example:

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0000 LD A, #%0006
0002 ADD A, #%0002
0003 LD Y, @A
0004 NOP
0005 NOP
0006 JP %0000
0008 NOP
```

Setting a breakpoint at %0008 and clicking GO causes the code to break at %0004 due to the data fetch address match during the prior instruction. This anomaly does not occur during Animate mode because Animate mode does not use hardware breakpoints.

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